More Thoughts on Nostratic Morphology

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1. Introduction

In a paper published in 2004 in *Nostratic Centennial Conference: The Pécs Papers*, I presented some preliminary thoughts on the reconstruction of Proto-Nostratic morphology. A revised and expanded version of that paper was incorporated into my 2008 book *Reconstructing Proto-Nostratic: Comparative Phonology, Morphology, and Vocabulary*. In the intervening years, I have continued my research and, as result, refined my views. In this paper, I would like to present a systematic reconstruction of Proto-Nostratic morphology taking into consideration my most recent findings (as of March 2018). This paper incorporates, corrects, and expands upon my previous work.

According to Dolgopolsky (1994:2838):

> The parent language had, most probably, an analytic grammatical structure with a strict word order (sentence-final predicate; object preceding the verb; nonpronominal attribute preceding the head; a special position for unstressed pronouns) and with grammatical meanings expressed by word order and auxiliary words (e.g., postpositions: **nu* for genitive, **ma* for marked accusative, and others). In the descendant languages this analytic grammar evolved towards a synthetic one.

My own research tends to support Dolgopolsky's views. The evidence indicates that, in its earliest phases of development, the Nostratic proto-language had an analytic morphological structure, though, in its latest phases, a certain amount of evolution toward a synthetic structure must already have taken place, since a synthetic grammatical structure is reconstructed for Afroasiatic, which was the earliest branch to separate from the rest of the Nostratic speech community. That a good deal of this evolution took place within Proto-Afroasiatic proper is beyond doubt, inasmuch as a variety of analytic formations can be found in other branches of Nostratic, some of which can be traced back to the Nostratic parent language.

2. Nostratic as an Active Language

The assumptions we make about the morphological and syntactical structure of a given proto-language profoundly affect the reconstructions that we propose. For example, in what follows, I will be proposing that Proto-Nostratic was an active language. Now, active languages exhibit specific characteristics (see below) that set them apart from other morphological types. Therefore, it follows that the reconstructions I posit will conform with an active structure. However, I believe quite emphatically that reconstructions must never be driven by theory alone.

Rather, they must be fully consistent with the supporting data. Moreover, not only must our reconstructions be consistent with the supporting data, they must be consistent from a typological perspective as well, and they must be able to account for later developments in the descendant languages in as straightforward a manner as possible, without recourse to ad hoc rules. When reconstructions are driven by theory alone, the results can be disastrous. Here, I will mention first the Moscow School reconstruction of the Proto-Nostratic obstruent system as an example. On the basis of a few seemingly solid cognates in which glottalized stops in Proto-Afrasian and Proto-Kartvelian correspond to what are traditionally reconstructed as plain voiceless stops in Proto-Indo-European, Illič-Svityč assumes that voiceless stops in the Indo-European data he cites always means that glottalized stops are to be reconstructed in Proto-Nostratic, even when there were no corresponding glottalized stops in Afrasian and Kartvelian. He goes so far as to set up an ad hoc rule to account for counter-examples. Another example is Décsy's 2002 book on Afrasian. Here, Décsy makes certain ad hoc assumptions about what must have existed in language in general at a certain time depth and then applies those assumptions to his reconstruction of Proto-Afrasian. Though it is not known where or when human language first appeared, the fossil record indicates that anatomically modern humans have been around for at least 200,000 years, perhaps longer. That is more than enough time for language to develop. To assume that complicated linguistic structures could not have existed 12,000 years ago, a mere fraction of the length of time that our species has been on this planet, is not a view that I can support. It should be noted here that this criticism does not apply to Décsy's books on Uralic (1990), Indo-European (1991), and Turkic (1998) in the same series.

Several scholars have recently presented persuasive arguments in favor of reconstructing an early phase of Proto-Indo-European as an active language (cf. especially Karl Horst Schmidt 1980; Gamkrelidze—Ivanov 1995; and Lehmann 1995 and 2002). Proto-Afrasian is also assumed to have been an active language (cf. Diakonoff 1988:85), as is Elamite (cf. Khačikjan 1998:61—66). Moreover, Nichols (1992:314, note 3) classifies Georgian as active. In active languages, subjects of both transitive and intransitive verbs, when they are agents semantically, are treated identically for grammatical purposes, while non-agent subjects and direct objects are treated differently (cf. Trask 1993:5—6). An "agent" may be defined as the entity responsible for a particular action or the entity perceived to be the cause of an action (cf. Trask 1993:11; Crystal 1992:11 and 2003:16).

Thus, there are two types of intransitive verbs in active languages (this will be explained in more detail below):

1. Those whose subjects have the same grammatical marking as the subjects of transitive verbs. These are Trask's "agent [subjects]". This type is referred to in this chapter as "active constructions".
2. Those whose subjects have the same grammatical marking as direct objects of transitive verbs. These are Trask's "non-agent subjects". This type is referred to in this chapter as "stative constructions".

To complicate matters, some verbs are "ambitransitive", that is, they can occur in either a transitive clause or an intransitive clause. Semantic and morphosyntactic considerations play an important role here (see Chapter 20 for more information).

Trask's (1993:5—6) complete description/definition of active type languages is as follows:

> active language *n.* (also agentive language) A language in which subjects of both transitive and intransitive verbs which are semantically agents are treated identically for grammatical purposes, while non-agent subjects and direct objects are treated differently. Among languages exhibiting this pattern are Sumerian, Batsbi (NE Caucasian), Crow (Siouxan) and Eastern Pomo (Hokan). The following examples from Eastern Pomo show the use of the two subject pronouns *há:* 'I' (agent) and *wí* 'I' (non-agent): *Há: mí:pal šá:ka* 'I killed him'; *Há: wádu:kìya* 'I'm going'; *Wí ʔéčkiya* 'I sneezed'. The correlation is rarely perfect; usually there are a few verbs or predicates which appear to be exceptional. In some active languages lexical verbs are rigidly divided into those taking agent subjects and those taking non-agent subjects; in others some lexical verbs can take either to denote, for example, differing degrees of control over the action. See Merlan (1985) for discussion. Cf. ergative language, accusative language, and see also split intransitive, fluid-intransitive. Sapir (1917).

Nichols (1992:9—10) lists the sets of typical features of active type languages established by Klimov (1977) as follows:

> Lexical properties:
>
> 1. Binary division of nouns into active vs. inactive (often termed *animate* and *inanimate* or the like in the literature).
> 2. Binary division of verbs into active and inactive.
> 3. Classificatory verbs or the like (classification based on shape, animacy, etc.).
> 4. Active verbs require active nouns as subject.
> 5. Singular-plural lexical suppletion in verbs.
> 6. The category of number absent or weakly developed.
> 7. No copula.
> 8. "Adjectives" are actually intransitive verbs.
> 9. Inclusive/exclusive pronoun distinction in first person.
> 10. No infinitive, no verbal nouns.
> 11. Etymological identity of many body-part and plant-part terms (e.g., "ear" = "leaf").
> 12. Doublet verbs, suppletive for animacy of actant.
>
> Syntactic properties:
>
> 13. The clause is structurally dominated by the verb.
> 14. "Affective" (inverse) sentence construction with verbs of perception, etc.

15. Syntactic categories of nearer or farther object rather than direct or indirect object.
16. No *verba habiendi*.
17. Word order usually SOV.
18. Direct object incorporation into verb.

Morphological properties:

19. The verb is much more richly inflected than the noun.
20. Two series of personal affixes on the verb: active and inactive.
21. Verbs have aspect or Aktionsarten rather than tense.
22. The noun has possessive affixes.
23. Alienable-inalienable possession distinction.
24. Inalienable possessive affixes and inactive verbal affixes are similar or identical.
25. Third person often has zero affix.
26. No voice opposition (since there is no transitivity opposition). Instead, there can be an opposition of what is called *version* in Kartvelian studies (roughly active vs. middle in the terminology of Benveniste 1966, or an opposition of normal valence vs. valence augmented by a second or indirect object, or an opposition of speech-act participant vs. non-participant in indirect-object marking on the verb).
27. Active verbs have more morphological variation or make more morphological distinctions than inactive verbs.
28. The morphological category of number is absent or weakly developed.
29. There are no noun cases for core grammatical relations (no nominative, accusative, genitive, dative). Sometimes there is an active/inactive case opposition.
30. Postpositions are often lacking or underdeveloped in these languages. Some of them have adpositions inflected like nouns.

Nichols (1992:8) notes that Klimov's definition of active type languages is close to, though not identical with, her definition of dominant stative-active alignment (see also Nichols 1992:8—9):

> According to Klimov, the basic determinant of linguistic type is what I call the *conceptual cast* of a language's predictions and its categorization of basic nominal and verbal notions; whether they are based on subject-object relations, agent-patient relations, an active/inactive distinction, referential properties, or others. The salient indicator of the conceptual cast is the stative-active, ergative, or accusative alignment of the clause, and this in turn determines the occurrence of a number of other categories. The whole set of properties — conceptual cast, alignment type, and attendant categories — constitutes the *type* of the language. (Klimov 1977 divides the relevant grammatical features into those that are more or less direct implicanda of type and those that are frequently observed secondary properties.) There are four basic types: the ACCUSATIVE TYPE, which grammaticalizes subject-object relations, the ERGATIVE TYPE, which grammaticalizes agent-factitive relations (for *factitive* — a semantic role essentially coinciding with the formal category of S/O of

> Dixon 1979 — see Kibrik 1979); the ACTIVE TYPE, which grammaticalizes an active/inactive or animate/inanimate principle; and (singled out only in the 1983 book) the CLASS TYPE, based on referential properties of nominals and having well-developed gender or class inflection. The first three types are named for their typical clause alignments, but in Klimov's view clause alignment is merely one of several symptoms (albeit a salient one) of the conceptual cast and hence type. Thus the active type is almost identical in extension but different in intension from the set of languages exhibiting stative-active alignment. Since the active type is focal in Klimov's sense, I will use his term *active* in his sense while using *stative-active* in what I take to be the current standard sense. Klimov carefully distinguishes type from features, faulting most contemporary typology for failing to make this distinction and pointing out that much of what is called typology is actually the cross-linguistic study of features rather than types. A type, in Klimov's view, is a set of independent but correlated features from different levels of grammar accompanied by a theory explaining the correlation.
>
> What is of particular interest to cross-linguistic comparison is the sets of typical features Klimov establishes for each type. For instance, he shows that the active type is associated with underdevelopment of number inflection, an inclusive/exclusive opposition in pronouns, an opposition of alienable to inalienable possession, classificatory verbs, grammaticalized animacy in nouns, and other features. The active and class types display the largest number of distinctive, interesting, and testable properties, and it is these traits that will be surveyed here.

Nichols (1992:65—66) describes various types of clause alignment as follows — note, in particular, her description of stative-active alignment (e):

> 2.0.4. *Clause alignment*. This term (taken from relational grammar) will be used here as generic for accusative, ergative, stative-active, etc. Only morphological alignment is surveyed in this study. The following categories are used, based on the morphological distinction or nondistinction of A, O, S (as those abbreviations are used by Dixon 1979 to refer to subject of transitive, direct object, and subject of intransitive respectively). The first five are standard and the last, hierarchical, is a well-described pattern with no standard label (Mallinson and Blake 1981 use the term *relative-hierarchical*).
>
> (a) Neutral: A = O = S, i.e., no inflectional oppositions.
> (b) Accusative: S = A; O distinct.
> (c) Ergative: S = O; A distinct. When a language has a major tense- or person-based ergative/accusative split and both patterns are salient, I count the language as primarily ergative, on the grounds that (following Silverstein 1976) most ergative systems are split and hence the split is part of the definition of "ergative".
> (d) Three-way: A, O, and S all distinct.
> (e) Stative-Active: S_1 = A, S_2 = O, the language has two different kinds of intransitive verbs, one taking ordinary subject marking (or the same subject marking as used with transitive verbs) and the other taking a subject whose marking is the same as that of the direct object of a

transitive. The choice of S_1 or S_2 is usually determined by the verb: "stative" verbs take S_2, "active" verbs S_1. (For this definition see Merlan 1985.)

If S_1 = A is the clear majority type in stative-active languages, the language can be described as having an accusative bias or slant: most intransitive subjects are formally identical to transitive subjects, so for the most part S = A. If S_2 = O is the clear majority type, the language has an ergative bias. I will speak of such languages as being stative-active on an accusative BASE or stative-active on an ergative base.

(f) Hierarchical: Access to inflectional slots for subject and/or object is based on person, number, and/or animacy rather than (or no less than) on syntactic relations. The clearest example of the hierarchical type in my sample is Cree. The verb agrees in person and number with subject and object, but the person-number affixes do not distinguish subject and object; that is done only by what is known as direct vs. inverse marking in the verb. There is a hierarchical ranking of person categories: second person > first person > third person. The verb takes direct marking when subject outranks object in this hierarchy, and inverse marking otherwise. In addition, verbs inflect differently depending on whether their S and O arguments are animate or not, a pattern which could be viewed either as another instance of hierarchical agreement or as different conjugation classes (rather than hierarchical access to agreement slots).

Next, Nichols (1992:100—105) describes head/dependent marking and alignment with regard to the various types of clause alignment mentioned above as follows (the tables given in the original are omitted here):

> The frequencies of the dominant alignment types exhibited by the various head/dependent types are shown in table 18. The accusative alignment has almost the same distribution as the total of all three alignment types; in other words, its distribution is not affected by head/dependent marking and we can conclude that it is equally compatible with all head/dependent types. The ergative alignment favors dependent-marking morphology: of the 28 ergative languages in the sample, 16 are dependent-marking and only four are strongly head-marking (Abkhaz, Wishram, and Tzutujil, all with 0.0 proportions; Yimas with 0.25). The ergative type is well installed and stable in these languages, however: the first three (Abkhaz, Wishram, Tzutujil) belong to well-described families (Northwest Caucasian, Chinookan, Mayan) that are consistently ergative.
>
> The stative-active and hierarchical types strongly prefer head-marking morphology, consistent with the fact that the verb is the favored part of speech for showing stative-active marking. It is of course possible for a dependent-marking language to have stative-active dominant alignment. The dependent-marking stative-active languages in my sample, plus one (Batsbi; see Holisky 1987) not in my sample, are listed below, with their head/dependent ratios, alignment of noun and verb, and whether the structural semantics of the oppositions is of the split-S or fluid-S type in the terms of Dixon 1979.
>
> The fluid-S type is rare overall among stative-active languages (Merlan 1985), and these examples show that the fluid-S type has a strong affinity for

case-marking languages. Head-marking stative-active languages are split-S with only one exception. Acehnese uses head marking to implement a fluid-S type (Durie 1985:185ff.). We can conclude that the unmarked kind of stative-active language is head-marking and split-S.

The correlation of head/dependent marking and alignment emerges more clearly if we plot the head-marking points in the clause against the alignment of the verb, as shown in table 19. The high frequency of neutral alignment in languages with no head marking in the clause is to be expected by definition: a language having no clause head marking has no marking on the verb, and no marking is neutral alignment. What requires comment is the non-neutral examples with zero clause head-marking. These include two languages that use detached marking, which I somewhat arbitrarily counted as marking of alignment on the verb. These two languages are Haida (stative-active) and Luiseño (accusative). Otherwise, once again the distribution of the accusative alignment is much like that of the total, and the stative-active and hierarchical alignments are concentrated in the head-marking end of the scale (higher numbers of H points in S). The ergative alignment is fairly evenly distributed throughout the scale except that it does not occur in languages with zero head marking in the clause (since ergativity cannot be marked on the verb if the verb has no marking).

It is apparently possible to combine any of the three major alignment types with any head/dependent type, though there are preferred and dispreferred combinations and there are gaps (which I interpret as accidental) in the distribution of the low-frequency types. The accusative alignment is equally compatible with all types, as is consistent with its generally preferred and unmarked status. The less frequent types have interesting asymmetries and limitations. The ergative alignment favors dependent marking. This is consistent with the fact that ergative, of all alignment types is prone to be marked on the noun (see §2.3.1), and this in turn may have to do with the fact that ergative alignment grammaticalizes nominal semantic roles. Stative-active and hierarchical alignments prefer head marking, and this is consistent with what they grammaticalize: the stative-active type grammaticalizes lexical categories of verbs, and the hierarchical type grammaticalizes relative ranking (for referential properties: animacy, person, etc.) rather than absolute functional status of clause arguments. The dependent-marked stative-active type is generally fluid-S, which is to say that it codes nominal semantic roles and not verb categorization. In general, the alignments that favor marking on nominals (ergative; fluid-S stative-active) are associated with grammatical-ization of nominal semantic functions; those that favor marking on verbs are associated with the grammaticalization of verbal semantics and/or the semantics of the whole clause. Thus we have a functional explanation, albeit a rather abstract one. But on a more general level, the distributional constraints on alignment types suggest that there is some kind of consistency between the morphological form of coding (head-marked or dependent-marked) and the semantics coded; fluid categories and NP relational semantics favor dependent marking, while split categories and verbal notions favor head marking. If the function of the part of speech bearing the marking influences the semantics coded, it is also true that the form of the coding, specifically its location, restricts its possible semantics.

> The correlation of stative-active type with head marking and ergative with dependent marking is difficult to demonstrate areally, partly because nonaccusative alignments are not common enough to form clear patterns in any but the largest areas and partly because ergative and stative-active alignments are roughly in complementary distribution across the areas. Table 20 shows that wherever the ergative alignment is at all frequent it is associated with dependent marking, and wherever the stative-active alignment is frequent it is associated with head marking. Even when neither is frequent, as in the smaller areas, there is still conformity in that in most cases the few stative-active entries are no more dependent-marking, and often more nearly head-marking, than the few ergative entries. The only counterexample is the Caucasus. The correlation emerges as significant by Dryer's test (reliably so if only the six continent-sized areas are considered; less reliably, but numerically more strongly, if all areas are counted).
>
> As mentioned in §2.0.4, stative-active languages can be described as having an ergative or accusative base, depending on whether the object-inflecting ("stative") or subject-inflecting ("active") set of intransitives is an open set. A base alignment can also be determined by considering the nominal and pronominal inflection, and sometimes also the inflection of transitive verbs. Information on closed and open classes of intransitives is not always available, but where available it indicates that most stative-active languages have an accusative base. Inflectional paradigms yield the same conclusion: ergative base alignment is rare outside of the Old World (where it is found in Georgian and Elamite). Languages with hierarchical dominant alignment have an accusative or neutral base without exception.

Regarding Georgian, Nichols (1992:314, note 3) remarks:

> Georgian is classified as stative-active because of its split transitivity. Hewitt 1987 gives detailed arguments against it on the grounds that the semantics of agent and patient does not determine case choice in intransitive subjects, but my definition of stative-active is not based on nominal semantic roles. Klimov 1977, 1983a classifies Georgian as belonging to the active type, although his classification is not based entirely on alignment: see the summary of his typology in §1.1.1 above.

Finally, Nichols (1992:116—117) discusses alienable and inalienable possession and its relationship to stative-active structure:

> Klimov 1977 finds that an opposition of alienable/inalienable possession is associated with the stative-active type. Nichols 1988, a survey limited to North America and Northern Eurasia, argues that the association is rather with head/dependent marking: inalienable possession almost always involves head marking, and head marking in NP's almost always entails an alienable/ inalienable opposition. Chappell and McGregor 1989 give a more comprehensive structural analysis along comparable lines, placing alienable and inalienable possession in a hierarchy which continues on to lexical compounds and classificatory nouns. (Welmers 1971:132ff. finds evidence for a further connection — in this case historical rather than typological — of

bound vs. free possession with nominal classes.) The present survey has supported most of the findings of Nichols 1988 and Chappell and McGregor 1989. Only possessive constructions taking the form of NP's are surveyed here.

In the literature, the opposition of inalienable to alienable possession is generally presented as a semantic one, but Chappell and McGregor 1989 and Nichols 1988 show that it is best approached as a structural opposition rather than a semantic one. Languages with an opposition of inalienable to alienable possession have split systems of possession marking, and alienable and inalienable are not cross-linguistic semantic constants but simply the extremes of the nominal hierarchy defined by the splits. The term *inalienable*, then, refers not to a semantic constant having to do with the nature of possession, but to whatever set of nouns happens to take inalienable possession marking in a given language. In terms of its grammatical form, inalienable possession always involves a tighter structural bond or closer connection between possessed and possessor, and the tightness of the bond can be described in terms of head and dependent marking. One of the most common patterns is that where possession is head-marked and there is no formal difference between alienable and inalienable possession, other than that there is an inalienable set of nouns that cannot occur with possessive affixation while alienables can be used alone. In some languages there is a formal difference between alienable and inalienable possessive affixes: both are head-marking, and those for inalienables are shorter, simpler, or more archaic than those for alienables…

There are several recurrent types of splits in the marking of possession, and all of them lend themselves to a single generalization: the inalienables take marking which is more nearly head-marking or less dependent-marking than the marking of alienables. Commonly, inalienable possession is head-marked while alienable is dependent marked…

The generalizations to be made about inalienable possession thus resemble, in the abstract, those made in §3.2 about the stative-active alignment: both are associated with head marking, and both involve split rather than fluid systems. Stative-active alignment is typically but not necessarily split (occasionally as fluid, as in Batsbi, Acehnese, Eastern Pomo, and Tonkawa) and typically but not necessarily associated with head marking (occasionally with dependent marking, as in Batsbi, Eastern Pomo, and Tonkawa). Inalienable possession appears to be necessarily split (never fluid) and necessarily associated with head/dependent marking. The correlation with head/dependent marking is shown in the fact that no language in my sample (and no language that I know of) uses only dependent marking to implement an alienable/inalienable distinction. (A language that did so would have two genitive cases, one for alienables and one for inalienables.) Inalienable possession is split rather than fluid in that the choice of marking is determined by the possessed noun rather than by the speaker's decision about semantics. No language has what one would want to call fluid possessive marking, which would require the speaker to decide, for each possessed noun, whether (say) the possessor could part with the possessed item, whereupon the speaker would choose the formal marking accordingly…

Additional information on the salient morphological characteristics of active type languages is presented at the beginning of Chapter 20, especially as it pertains to positing an active-type structure for an early period of development in Proto-Indo-European. See also Andréasson 2001, Donohue—Wichmann (eds.) 2008, Dixon 1994, and Dixon—Aikhenvald (eds.) 2000, 2003, and 2009. For information on the typologically rare marked-S languages, cf. Handschuh 2014.

The distribution of agent and patient markers (cases) in an accusative system, an ergative system, and an active system may be summarized as follows:

<table>
<tr><td colspan="2"></td><td>Accusative</td><td>Ergative</td><td colspan="2">Active</td></tr>
<tr><td rowspan="2">Subject</td><td>Transitive</td><td rowspan="2">Nominative</td><td>Ergative</td><td rowspan="2">Agentive</td><td></td></tr>
<tr><td>Intransitive</td><td rowspan="2">Absolutive</td><td rowspan="2">Patientive</td></tr>
<tr><td colspan="2">Object</td><td>Accusative</td><td></td></tr>
</table>

3. Proto-Nostratic Phonological System

Proto-Nostratic had a rich system of stops and affricates. Each stop and affricate series was characterized by the three-way contrast: (1) voiceless (aspirated), (2) voiced, and (3) glottalized. The aspiration of series (1) was phonemically non-distinctive.

The Proto-Nostratic phonological system may tentatively be reconstructed as follows (cf. Bomhard—Kerns 1994:122; Bomhard 2008.I:213—214, 2011:8—9, and 2018.1:265:; Illič-Svityč 1971—1984.I:147—171; Dolgopolsky 1998:101 [correspondences, pp. 102—105] and 2008:§2):

Stops and Affricates:

p^h	t^h	c^h	$č^h$	t^{yh}	$t\widehat{ɬ}^h$	k^h	k^{wh}	q^h	q^{wh}		
b	d	ʒ	ǯ	d^y	$d\widehat{ɮ}$ (?)	g	g^w	ɢ	$ɢ^w$		
p’	t’	c’	č’	$t’^y$	$t\widehat{ɬ}’$	k’	$k’^w$	q’	$q’^w$	ʔ	$ʔ^w$

Fricatives:

	s	š	s^y	x	x^w		h	ħ
	z	ž (?)	z^y (?)	γ				ʕ

Glides:

w		y

Nasals and Liquids:

m	n	n^y	ŋ
	l	l^y	
	r	r^y	

(It may be noted that the above reconstruction is extremely close to what Ehret [1980:37] posits for Proto-Southern Cushitic, but without the retroflex and pre-nasalized sounds.)

Vowels:	i (~ e)		u (~ o)		
	e		o		
		(ə ~) a			

Also the sequences:	iy (~ ey)	uy (~ oy)	ey	oy	(əy ~) ay
	iw (~ ew)	uw (~ ow)	ew	ow	(əw ~) aw

As can be seen, the phonological system reconstructed above for Proto-Nostratic resembles that of Proto-Afroasiatic more closely than it does the phonological systems of any of the other branches. (For details about Proto-Afroasiatic phonology, cf. Diakonoff—Militarëv—Porxomovsky—Stolbova 1987; Diakonoff 1988:34—40; D. Cohen 1968:1300—1306; Orël—Stolbova 1995:xvi; Ehret 1995:480—482; Bomhard 2008.I:149—176; Takács 2011.) This is as it should be, inasmuch as Afroasiatic was the oldest branch, the first to become separated from the rest of the Nostratic speech community. Likewise, Proto-Afroasiatic, together with Proto-Dravidian, are of paramount importance for the reconstruction of Proto-Nostratic morphology (see Bomhard 2018, Chapters 16, 17, and 18, for details).

4. Remarks on the Vowels

The following vowels may be reconstructed for Proto-Nostratic: **a*, **e*, **i*, **o*, and **u*. At least some of these vowels must have been subject to considerable subphonemic variation in the Nostratic parent language. The high front and back vowels **i* and **u*, in particular, may be assumed to have had lowered variants (indicated in the Proto-Nostratic reconstructions as **e* and **o* respectively), while the central low vowel **a* may be assumed to have had higher variants (indicated in the Proto-Nostratic reconstructions as **ə*). To complicate matters, **e* and **o* must also have existed as independent vocalic elements. It was the reanalysis, phonemicization, and exploitation of this subphonemic variation that gave rise, at least in part, to the ablaut and vowel harmony patterning found in the majority of the Nostratic daughter languages. It may be noted here that, according to Greenberg (1990), traces of an earlier system of vowel harmony can be discerned in Proto-Indo-European.

It is unclear whether phonemic long vowels existed in Proto-Nostratic as well, though the evidence seems to indicate that they did not, except, probably, in nursery words.

Finally, it may be noted that, while any vowel (**a*, **e*, **i*, **o*, **u*) could appear in initial syllables, only **a*, **i*, **u* could appear in non-initial syllables. This is identical to the patterning found in Dravidian.

The Proto-Nostratic vowels were, for the most part, preserved in initial syllables in Uralic, Dravidian, and Altaic. They appear to have been originally preserved in Proto-Afroasiatic as well. Within Afroasiatic, Cushitic and Omotic are particularly conservative in their vocalism, while the vowel systems found in Semitic, Egyptian, and Berber exhibit a wholesale reduction of the inherited system (cf. Ehret 1995:55—67).

The system of vowel gradation found in Semitic, Egyptian, and Berber initially arose through morphological processes that will be discussed later in this paper. It appeared quite early in verbal stems and derivative nominal stems, though primary root nouns continued to maintain stable vocalism right up to the emergence of the individual daughter languages. Once established, the system of vowel gradation was greatly expanded, especially in Semitic.

The inherited vowel system underwent a thorough restructuring in both Proto-Indo-European and Proto-Kartvelian as a result of a complicated series of changes initiated by the phonemicization of a strong stress accent in the early prehistory of these branches. These developments diminish the importance of Kartvelian and Indo-European for ascertaining the Proto-Nostratic vowel system.

5. Ablaut in Proto-Nostratic

An analysis of the Afrasian data seems to indicate that there was an alternation between the vowels **a*, **i*, and **u* in Proto-Afrasian roots and that that alternation may have had some sort of morphological or semantic significance. This is most evident in the Proto-Afrasian reconstructions proposed by Orël—Stolbova (1995), where different root vowels are sometimes posited by them for two (or more) stems, all of which are clearly variants of the same root. Each stem is listed by them as a separate entry, though the stem is usually cross-referenced to the related entry or entries. At the present state or research, however, it is simply not possible to ascertain the details of that patterning and what that patterning may have signified. In my 2018 book, Proto-Nostratic roots are reconstructed with stable vowels (and their subphonemic variants). Tone may also have played a role in Proto-Nostratic.

6. Root Structure Patterning in Proto-Nostratic

Comparison of the various Nostratic daughter languages makes it possible to determine the rules governing the structural patterning of roots and stems in Proto-Nostratic. Most likely, the patterning was as follows:

1. There were no initial vowels in Proto-Nostratic. Therefore, every root began with a consonant.
2. There were no initial consonant clusters either. Consequently, every root began with one and only one consonant. Medial clusters were permitted, however.

3. Two basic root types existed: (A) **CV* and (B) **CVC*, where *C* = any non-syllabic, and *V* = any vowel. Permissible root forms coincided exactly with these two syllable types.
4. A stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC*+*C*-. Any consonant could serve as a suffix. Note: In nominal stems, this derivational suffix was added directly to the root: **CVC*+*C*-. In verbal stems, it was added to the root plus formative vowel: **CVC*+V+*C*-.
5. A stem could thus assume any one of the following shapes: (A) **CV*-, (B) **CVC*-, (C) **CVC*+*C*-, or (D) (reduplicated) **CVC*-*CVC*-. As in Proto-Altaic, the undifferentiated stems were real forms in themselves and could be used without additional suffixes or grammatical endings. However, when so used, a vowel had to be added to the stem: (A) **CV*- > **CV* (no change), (B) **CVC*- > **CVC*+V, (C) **CVC*+*C*- > **CVC*+*C*+V, or (D) (reduplicated) **CVC*-*CVC*- > **CVC*-*CVC*+V. Following Afrasian terminology, this vowel may be called a "terminal vowel" (TV). Not only did terminal vowels exist in Proto-Afrasian (cf. Ehret 1995:15; Bender 2000:214—215 and 2007:737—739; Mous 2012: 364), they are also found in Dravidian, where they are called "enunciative vowels" (cf. Steever 1998a:15; W. Bright 1975; Krishnamurti 2003:90—91; Zvelebil 1990:8—9), and in Elamite (cf. Khačikjan 1998:11; Grillot-Susini 1987:12; Stolper 2004:73), where they are called "thematic vowels". In Proto-Dravidian, the enunciative vowel was only required in stems ending in obstruents, which could not occur in final position.

Concerning enunciative vowels in Dravidian, Zvelebil (1990:8—9) notes:

> No obstruents can occur finally. When they do, they are followed by a "non-morphemic" automatic (so-called epenthetic, or 'enunciative' or 'euphonic', i.e. predictable morphophonemic) vowel *-ə which is regularly dropped according to morphophonemic rules…

While Krishnamurti (2003:90—91) writes:

> If the stem ends in a stop, it is followed by a non-morphemic or enunciative vowel /u/. Roots of (C)VC- and (C)VCC- contrast when followed by formatives or derivative suffixes beginning with vowels. It is not clear if the difference between root-final C and CC is determined by the nature of the derivative suffix that follows. When roots in final obstruents are free forms, the final consonant is geminated followed by a non-morphemic (enunciative) *u*. When roots of the type (C)V̄C- or (C)VCC- are followed by a formative vowel, V_2 = /i u a/, they merge with (C)VC-.

Ehret (1995:15) makes the following observations about the terminal vowels in Proto-Afrasian:

> The Omotic, Cushitic, and Chadic evidence conjoin in requiring the existence in PAA of an additional element in word formation, a terminal vowel (TV) in nouns and modifiers, the original function and meaning of which remain obscure. TVs have been subjected to comparative-historical investigation in only two groups of Afroasiatic languages. In Omotic they have no reconstructible function beyond their necessary attachment to singular noun stems in semantically predictable fashion. With the exception of Kafa, in which two TVs, *-o* and *-e*, have been grammaticalized respectively as masculine and feminine markers, they carry no grammatical or recognizable semantic load (Hayward 1987). In proto-Southern Cushitic, pairs of TVs formed a variety of singular-plural markers. Particular paired sets tended to go with either masculine or feminine nouns, but an individual TV on a singular noun generally gave no indication of the grammatical gender of that noun (Ehret 1980:49—50).
>
> From these indicators it seems reasonable to conclude that TVs are fossils of a nominal morphology productive in pre-proto-Afroasiatic and predating the rise of grammatical gender in the family. Having lost their original grammatical function, they have been reanalyzed as markers of the singular or sometimes, as in the case of Southern Cushitic, of the plural in nominals. In the Boreafrasian subgroup (Semitic, Egyptian, and Berber: see Chapter 6 for this classification), the TVs have generally been dropped entirely, leaving most nouns and adjectives as consonant-final words.
>
> The existence of TVs at early stages of Afroasiatic evolution obviates the need to reconstruct any syllabic consonants for PAA. The usual word structure of nouns and adjectives would have been $*C_1(VC_2)(C_s)V_{tv}$, in which the only possible structures are CVC and CV and never just C. The presence of syllabic C in Boreafrasian languages can be understood as the natural outcome of vowel loss, whether word-internal or word-final, within that particular subgroup (as is also separately the case in a few modern Omotic languages, notably Bench and Maji, where the same kind of sound change has independently been at work).

While Bender (2000:214—215) makes the following comments about Omotic:

> Hayward (1987, 1980a, 1980b) reported in some detail on the matter of "terminal vowels" (TVs) found in sg. nouns in Ometo languages and Ari. Hayward states that the TVs in Ari are often independent of the root (1990b:440) and that in Zaysé, they are appendages, not part of the root, but being unpredictable, must be included in lexical entries (1990a:242). In some cases, final vowels distinguish gender. This is much more the case with pronominals, but I restrict the term "TVs" to the nominal category in non-derived and non-inflected form (except insofar as TV may mark gender)…
>
> In the 1990c article, variation of vowels beyond the "cardinal" *i*, *e*, *a*, *o*, *u* did not seem to be significant in TVs. TVs are prominent in all branches except Gimira, where CVC is the norm, with tone carrying a high functional load. It would be tidy if TVs were reconstructable: they would thus be predictable across languages if not within languages according to lexical items. But first of all, there is no unanimity among the sources: different investigations record different TVs and even one source may have alternative forms.

As noted above, terminal vowels are only used with nouns and modifiers in Afrasian, while in Dravidian, the single reconstructible terminal vowel, *-*u*, is used after any free-form stem ending in an obstruent. For Proto-Nostratic, the patterning may be assumed to have been as follows: If an undifferentiated nominal or verbal stem was used as a free-form, a terminal vowel had to be added. In Proto-Nostratic, the terminal vowels were: **a*, **i*, and **u*. The origin of terminal vowels will be investigated below.

The original root structure patterning was maintained longer in Afrasian, Dravidian, and Altaic than in the other branches, while the patterning found in Proto-Indo-European and Proto-Kartvelian has been modified by developments specific to each of these branches. The root structure constraints found in Proto-Indo-European were an innovation. In Proto-Uralic, the rule requiring that all words end in a vowel (cf. Décsy 1990:54) was an innovation and arose from the incorporation of the so-called "terminal vowel" into the stem. It should be noted that reduplication was a widespread phenomenon in Proto-Nostratic. It was one of the means used to indicate plurality in nouns, while, in verbs, it may have been used in frequentive and habitual formations.

On the basis of the evidence of Proto-Indo-European, Proto-Kartvelian, Proto-Afrasian, Proto-Dravidian, and Proto-Altaic, it may be assumed that there were three fundamental stem types: (A) verbal stems, (B) nominal (and adjectival) stems, and (C) pronominal and indeclinable stems. Some stems were exclusively nominal. In the majority of cases, however, both verbal stems and nominal stems could be built from the same root. In Proto-Nostratic, only pronominal and indeclinable stems could end in a vowel. Verbal and nominal stems, on the other hand, had to end in a consonant, though, as noted above, when the undifferentiated stems were used as real words in themselves, a "terminal vowel" had to be added to the stem. As we shall see below, the "terminal vowels" were morphologically significant. Adjectives did not exist as an independent grammatical category in Proto-Nostratic.

As in Proto-Kartvelian, it appears that Proto-Afrasian underwent several syntactic shifts in its prehistoric development. Surely, the VSO pattern found in Semitic, Egyptian, and Berber is an innovation. While it is not possible to trace the exact developments, it seems likely that the original pattern was SOV, which is what is found in the majority of Cushitic languages. Ehret (1995:52) arrives at the same conclusion for Proto-Afrasian. He notes that nominalizing morphology in Proto-Afrasian was predominantly suffixal. One little aside: The more I look at the matter, the more I am convinced that, within Afrasian, Semitic is the most aberrant branch. In view of this, notions of what Proto-Afrasian might have been like, based primarily upon the Semitic model, are likely to be false.

7. Prehistory of Root Structure Patterning and the Development of Terminal Vowels

During the earliest period of Proto-Nostratic, *roots* could only have the forms: (a) **CV*- and (b) **CVC*-. Type (a) was restricted to pronominal stems and

indeclinables, while type (b) characterized nominal and verbal stems. A single *derivational suffix* could be placed after root type (b): **CVC+C* (derivational suffix [DS]). Grammatical relationships were indicated by placing *particles* either after the undifferentiated stem or after the stem plus a derivational suffix: (a) **CVC + CV* (particle [P]) or (b) **CVC+C* (derivational suffix [DS]) + *CV* (particle [P]). In nominal stems, a morphologically significant *terminal vowel* (TV) had to be added directly after the root, while in verbal stems, a *formative vowel* (FV) had to be added between the root and any following element, be it derivational suffix or particle; thus, we get the following patterns:

(a) (noun stem) $*CVC(+C_{DS})+V_{TV}$ (plus particle): $*CVC(+C_{DS})+V_{TV}+CV_P$
(b) (verb stem) $*CVC+V_{FV}(+C_{DS})$ (plus particle): $*CVC+V_{FV}(+C_{DS})+CV_P$

The derivational suffixes were derivational rather than grammatical in that they either changed the grammatical category of a word or affected its meaning rather than its relation to other words in a sentence. Cf. Crystal 2008:138 and 243.

This is essentially the stage represented in Proto-Dravidian, though Proto-Dravidian has added long vowels to the equation as well as stems beginning with a vowel (no doubt arising from the loss of initial laryngeals) (cf. Krishnamurti 2003:179—184 and 277—279). Next, the formative vowel was reinterpreted as part of the derivational suffix in verbal stems: **CVC+VC+CV*. This is the stage represented by Proto-Afrasian (cf. Diakonoff 1988:85—110; Ehret 1995:15 and 27—34) and is the basis for the root structure patterning found in Proto-Kartvelian and Proto-Indo-European as well. From an Afrasian perspective, there is no such thing as "formative vowels" — they are only preserved in Dravidian and Elamite, though, in Elamite, their status is disputed (cf. Reiner 1969:78).

In Proto-Dravidian, the original meaning of the formative vowels was lost. According to Krishnamurti (2003:97), the formative vowels "apparently had an epenthetic role of splitting clusters without affecting the syllable weight …" Note the following examples given by Krishnamurti (2003:181):

1. **tir-a-y-* (**-p-*/**-mp-*, **-nt-*) 'to roll (intr.)'; **tir-a-y-* (**-pp-*/**-mpp-*, **-ntt-*) 'to roll up (tr.)', (n.) **tir-a-y* 'wave, screen, curtain'; **tir-a-nku* 'to be curled up (intr.)', **tir-a-nkku* 'to shrivel (tr.)';
2. **tir-a-ḷ-* (**-p-*, **-ṇṭ-*) 'to become round (intr.)', **tir-a-ḷ-* (**-pp-*, **-ṇṭṭ-*) 'to make round (tr.)';
3. **tir-i-* (**-p-*, **-nt-*) 'to turn (intr.)', **tir-i-* (**-pp-*, **-ntt-*) 'to turn (tr.)'; **tir-u-ku* 'to twist (intr.)', **tir-u-kku* 'to twist (tr.)'; **tir-u-mpu* 'to twist, to turn (intr.)', **tir-u-mppu* 'to twist, to turn (tr.)';
4. **tir-u-ntu* 'to be corrected, to be repaired (intr.)', **tir-u-nttu* 'to correct, to rectify (tr.)'.

As stated by Krishnamurti (2003:181), "[t]he Proto-Dravidian root is obviously **tir-*, meaning 'turn, roll, twist, change shape' → 'correct', etc. The formatives occur in two layers. The first layer is V = *i*, *a*, *u*; and the second layer, either a

sonorant (L) as in *y*, *l*; or a simple or geminated stop ± homorganic nasal: P as in **ku*; PP as in **kku*; NP as in **nku*, **ntu*, **mpu*; NPP as in **nkku*, **nttu*, **mppu*."

In Elamite, verbal stems consisted either of a root ending in a vowel or of a root extended by a thematic vowel if the root ended in a consonant: *kuk-i* 'to protect' (< *kuk-*) (cf. Khačikjan 1998:13). Khačikjan (1998:11) also notes:

> Elamite was an agglutinative suffixal language. The suffixes joined either the root or the stem.
>
> The root morpheme consisted mostly of two consonants and one or two vowels: *nap* 'deity', *ruh* 'man', *zana* 'lady', *kap* 'treasure', *kik* 'sky', etc.
>
> The stem consisted of a root ending in a consonant, with thematic vowels *-i*, *-u*, *-a*, cf. *per-i-*, *mur-u-*, *tahh-a-* (< *tah-*). The thematic vowels *-u* and *-a* were only attested with verbal stems, whereas *-i* with nominal and nomino-verbal ones: *tir-i-* 'to speak', *kukk-i* 'vault, roof', *peti-* 'enemy; to revolt'.

Reiner (1969:78) notes, likewise, that the Elamite verb base always ended in a vowel: CVCV, CVCCV, and, though more rarely than the first two types, CV. Reiner argues against treating the thematic vowel ("stem-vowel") as a separate morpheme. Khačikjan, however, follows Paper in considering the thematic vowel to be a separate morpheme. Grillot-Susini (1987:32) simply states: "The structure of the verb is analogous to that of the noun. It consists of a base (simple root or enlarged by *-i*/*u*/*a*) to which the inflections of the verbal conjugation, the participial formants, and/or the nominal person suffixes are attached."

Now, it is curious that the formative vowel can take different shapes in Proto-Dravidian: **a*, **i*, or **u*. This seems to indicate that the different formative vowels must have had some sort of morphological significance at an earlier point in time, though this distinction was lost in Proto-Dravidian proper. Not only must the formative vowels have had morphological significance, the terminal vowels must also have had morphological significance.

The formative vowels found in verbal stems may have been aspect markers, as Zaborski has tried to show for Omotic (cited in Bender 2000:217). Here, according to Zaborski, the patterning was as follows: *a* marks present (imperfective), *i* ~ *e* mark past (perfective), and *u* ~ *o* mark subordinate. Though originally supportive of Zaborski's views, Bender later became skeptical, pointing out that he finds the consonantal markers to be more significant. Indeed, for Omotic or even Afrasian, this is what we would expect. But Zaborski's views are not so easily dismissed. What he may have uncovered is a more archaic pattern, as Bender himself admits. In Finno-Ugrian, the ending **-i-* shows up as a past tense marker (cf. Collinder 1960:305—307 and 1965:132—134; Décsy 1990:76). Likewise in Dravidian, where the suffix **-i-* is one of several used to mark past tense (cf. Krishnamurti 2003:296—298). These may ultimately be derived from a perfective marker **-i-*.

As noted above, when the unextended root (**CVC-*) served as the verbal stem, the formative vowel (aspect marker) was added directly to the root: **CVC*+V_{FV}.

For nominal stems, the situation is a bit more complicated. Diakonoff (1988:59—61) reconstructs two "abstract" case forms for Proto-Afrasian: (a) **-i*/**-u* and (b) **-Ø*/**-a*. Diakonoff notes that the best preserved case marker was **-i*. It

served two functions: (a) nominative-ergative and (b) genitive (in the sense 'belonging to'). In Cushitic, it often has two variants: (a) a short one in *-i* and (b) an "expanded" one in *-iya* or *-ii*. Given the identical form of the nominative-ergative and genitive, Diakonoff assumes that the nominative-ergative function arose from the genitive function. For *-*Ø*/*-*a*, Diakonoff assumes that it represented "the noun outside of grammatical links (the so-called '*status indeterminatus*') or the noun-predicate (the so-called '*status praedicativus*'), but also the subject of a state or condition, including the subject of the state that resulted from the action." Finally, it should be noted that Sasse (1984:117) reconstructs the following two declensional paradigms for nouns with short final vowels for Proto-East Cushitic (see also Appleyard 1996:7 — for Omotic parallels, cf. Zaborski 1990):

	Masculine	Feminine
Absolute Case	*-*a*	*-*a*
Subject Case	*-*u/i*	*-*a*

Sasse (1984) discusses the development of this system within Cushitic and ends by noting that traces of the above patterning can also be found in Semitic and Berber (Proto-Semitic nominative *-*u*, accusative *-*a*, genitive *-*i* [cf. Hasselbach 2013]).

I assume that the following patterning existed in early Proto-Nostratic:

1. *-*u* was used to mark the subject (the agent) in active constructions — these subjects "perform, effect, instigate, and control events" (Mithun 1991:538);
2. *-*i* indicated possession;
3. *-*a* was used to mark:

    (a) The direct object (the patient) of transitive verbs;
    (b) The subject ("non-agent subject" [= the patient]) in stative constructions — these subjects are "affected; things happen or have happened to them", just like direct objects (Mithun 1991:538);
    (c) The so-called "*status indeterminatus*".

In later Proto-Nostratic, this patterning became disrupted, though, as we have seen, it may have survived into Proto-Afrasian. In later Proto-Nostratic, the relational markers *-*ma* and *-*na* came to be used to mark the direct object of transitive verbs as well as the subject in stative constructions. Eventually, these relational markers became the primary means of marking the direct object of transitive verbs or the subject in stative constructions, with the result that the older patterning became disrupted. Thus, in the latest stage of the Nostratic parent language, we find the following patterning:

1. *-*u*: used to mark the subject in active constructions:

    (a) **CVC+u*

(b) **CVC+C$_{DS}$+u*
(c) **CVC-CVC+u*

2. **-a* ~ **-ma*/**-na*: used to mark the direct object of transitive verbs as well as the subject in stative constructions:

(a)	**CVC+a*	plus **-ma*/**-na*: **CVC+a+ma/na*
(b)	**CVC+C$_{DS}$+a*	plus **-ma*/**-na*: **CVC+C$_{DS}$+a+ma/na*
(c)	**CVC-CVC+a*	plus **-ma*/**-na*: **CVC-CVC+a+ma/na*

-ma*/-na* was the first case form (bound relational marker) to develop in Proto-Nostratic. The second was the genitive (in the sense 'belonging to') in **-nu*. Indeed, these are the only two bound relational markers that can be confidently reconstructed for the latest period of Proto-Nostratic (see below for more information). Finally, it seems likely that unextended **-a* remained as the indicator of the *status indeterminatus*.

In Elamite, the **-a* (and **-u* ?) variant was eliminated in nominals. Dravidian, on the other hand, underwent further developments. Here, **-i* ~ **-a* were reinterpreted as oblique markers (on which, cf. Krishnamurti 2003:225—226), while **-u* assumed the role of enunciative vowel (cf. Krishnamurti 2003:91: "[w]hen roots in final obstruents are free forms, the consonant is geminated followed by a non-morphemic [enunciative] *u*.)".

This, then, explains the origin of both the so-called "formative vowels" and "terminal vowels". It may be noted here that Ehret (1995:15) concludes that the terminal vowels found in Afrasian "are fossils of a nominal morphology productive in pre-proto-Afroasiatic and predating the rise of grammatical gender in the family. Having lost their original grammatical function, they have been reanalyzed as markers of singular or sometimes, as in the case of Southern Cushitic, of the plural in nominals." As a further note, the terminal vowel **-a* may ultimately be the source of the highly productive thematic stems in later Proto-Indo-European.

Ehret does not reconstruct formative vowels for Proto-Afrasian. In this, he is correct. As noted above, in Proto-Afrasian, the earlier formative vowels have been reinterpreted as part of the derivational suffixes.

8. Rules of Proto-Nostratic Syntax

Dolgopolsky (1984:92—93 and 2005) sets up the following rules of Proto-Nostratic syntax:

A. Words are classified into three groups (which differ in their syntactic behaviour):
   a) Full Words (in the sense of the Chinese traditional grammar, i.e. semantic counterparts of nouns, adjectives, adverbs and verbs of modern languages),

b) Pronouns,
c) Grammatical Words (i.e. case-markers).

B. Pronouns (if stressed) can behave syntactically according to the rules of Full Words as well.
C. The predicate is the last Full Word of the sentence.
D. Any object precedes its verb (i.e. its Full Word with verbal meaning).
E. Any attribute (expressed by a Full Word) precedes its *regens*.
F. A pronoun (personal or demonstrative) functioning as attribute follows its *regens*. In this case a personal pronoun has possessive meaning.
G. A pronoun functioning as subject follows its predicate.
H. Case-markers follow the corresponding Full Word. Some of these (genitive-marker **nu*, accusative-marker **ma*) follow immediately after its Full Word, while others (such as locative postpositions) can be used in a construction Full Word + **nu* + postposition. This accounts for *-*n*- preceding the case-ending in the oblique cases of the IE heteroclita, for the increment *-*in*-/-*n*- preceding the case endings of the oblique cases in D[ravidian], for some F[inno-] U[grian] case forms (locative *-*na* < **nu Ha*), as well as for the *-*n*-increment in the personal pronominal stems in the oblique cases (→ all cases) in U[ralic], T[urkic], T[ungusia]n, and D[ravidian]…

A logical corollary of rules C—E is that the subject (if it is a Full Word) occupied the remaining place: somewhere in the initial part of the sentence.

These rules have been preserved almost entirely (either as syntactic rules of word-order or as morpheme-order in grammatical forms) in Uralic, Turkic, Mongolian, Tungusian, Gilyak, Korean, Japanese, Dravidian, Early Indo-European, Cushitic, and have determined the order of morphemes within words in the rest of the Nostratic languages.

Proto-Nostratic syntax was head-final, or left-branching, that is, dependents preceded their heads according to the so-called "rectum-regens rule". In other words, "adverbs" preceded verbs, "adjectives" preceded nouns, and auxiliaries followed the main verb, though it must be emphasized here that adjectives did not exist as an independent grammatical category in Proto-Nostratic (see below for details). The unmarked syntactical order was Subject + Object + Verb (SOV).

From a typological perspective, the native American language Yuki of northern California (cf. Kroeber 1911) may be cited as an example of a language structurally similar to Proto-Nostratic. Hurrian (cf. Bush 1964; J. Friedrich 1969a; Laroche 1980; Speiser 1941; Wegner 1999 and 2007; Wilhelm 2004a) may be mentioned as another language that was structurally similar to Proto-Nostratic during the latest period of development, when bound morphemes had started to appear, though Proto-Nostratic had active alignment, while Hurrian had ergative alignment.

9. Pronominal, Deictic, and Anaphoric Stems

9.1. First Person Stems

First person singular (active): **mi*
First person plural (inclusive, active): **ma*
First person (stative): **$k^h a$*
First person (stative): **ħa*
First person singular: **na*
First person plural (exclusive, active): **na*
First person (postnominal possessive/preverbal agentive): **ʔiya*

9.2. Second Person Stems

Second person: **$t^h i$*, (oblique) **$t^h a$*
Second person: **si*
Second person: **ni*

9.3. Anaphoric and Deictic Stems

Pronominal base of unclear deictic function: **-gi* (~**-ge*)
Deictic particle: (A) **ʔa-* (~ **ʔə-*) (distant), (B) **ʔi-* (~ **ʔe-*) (proximate), and (C) **ʔu-* (~ **ʔo-*) (intermediate)
Deictic particle: (A) **$k^h a$-* (~ **$k^h ə$-*) (proximate), (B) **$k^h u$-* (~ **$k^h o$-*) (distant), and (C) **$k^h i$-* (~ **$k^h e$-*) (intermediate)
Deictic particle: (A) **$t^h a$-* (~ **$t^h ə$-*) (proximate), (B) **$t^h u$-* (~ **$t^h o$-*) (distant), and (C) **$t^h i$-* (~ **$t^h e$-*) (intermediate)
Deictic particle: **ša-* (~ **šə-*)
Anaphoric pronoun stem: **si-* (~ **se-*)
Anaphoric pronoun stem: **na-*, **ni-*
Deictic particle: **$t^{yh} a$-* ‘that over there, that yonder (not very far)’

Note: The deictic particles (A) **ʔa-* (~ **ʔə-*) (distant), (B) **ʔi-* (~ **ʔe-*) (proximate), and (C) **ʔu-* (~ **ʔo-*) (intermediate) often combined with other deictic stems.

9.4. Interrogative, Relative, and Indefinite Stems

Relative: **$k^{wh} i$-* (~ **$k^{wh} e$-*); interrogative: **$k^{wh} a$-* (~ **$k^{wh} ə$-*)
Interrogative-relative stem: **ʔay-*, **ʔya-*
Interrogative: **mi-*; relative: **ma-*
Interrogative-relative: **na*
Indefinite: **ma-*, **mi-*, **mu-*
Indefinite: **$d^y i$-* (~ **$d^y e$-*) ‘this one, that one’

9.5. Summary

The following two tables correlate the reconstructions for the Proto-Nostratic first and second person personal pronoun stems proposed in this paper (column A) with those proposed by Illič-Svityč (1971—1984; also V. Dybo 2004) (column B), Dolgopolsky (1984, 2005, and 2008) (column C), Greenberg (2000) (column D), and Kortlandt (2010a/b/c) (column E):

A. First person personal pronouns:

	A	B	C	D	E
1st pers. sg. (active)	**mi*	**mi*	**mi*	**m*	**mi*
1st pers. pl. (incl., active)	**ma*	**mä*		**m*	**me*
1st pers. (stative)	**kʰa*			**k*	
1st pers. (stative)	**ħa*				
1st pers. sg.	**na*	**naHe-na*, **na*		**n*	
1st pers. pl. (excl., active)	**na*		**nīV*	**n*	
1st pers. (postnominal)	**ʔiya*		**HoyV*		

B. Second person personal pronouns:

	A	B	C	D	E
2nd pers.	**tʰi*, **tʰa*	**ṭʌ-na*, **ṭa*	**ṭ[ü]* (> **ṭi*)	**t*	**te*
2nd pers.	**si*	**si-* possessive	**ś[ü]* (> **śi*)	**s*	
2nd pers.	**ni*			**n*	

This table correlates the reconstructions for the Proto-Nostratic anaphoric, deictic, interrogative, relative, and indefinite stems proposed in this paper (A) with those proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Deictic particle	**-gi* (~ **-ge*)			**ge*	
Deictic particle	**ʔa-* (~ **ʔə-*), **ʔi-* (~ **ʔe-*), **ʔu-* (~ **ʔo-*)	**ʔa*, **ʔi*/**ʔe*	**ha*, **[h]e*, **[h]i*, **[h]u*	**i* ~ **e*, **a* ~ **e*	**i*/**e*
Deictic particle	**kʰa-* (~ **kʰə-*), **kʰu-* (~ **kʰo-*), **kʰi-* (~ **kʰe-*)		**K̲[ü]*	**ku*	
Deictic particle	**tʰa-* (~ **tʰə-*), **tʰu-* (~ **tʰo-*), **tʰi-* (~ **tʰe-*)	**ṭa*	**ṭä*	**t*	**t*

	A	B	C	D	E
Deictic particle	**ša-* (~ **šə-*)			**s*	**s*
Anaphoric stem	**si-* (~ **se-*)	**šä*	**sE*		
Anaphoric stem	**na-*, **ni-*		**nE* (dual)		
Deictic particle	**$t^{y^h}a$-*		**ćE*		
Relative	**$k^{wh}i$-* (~ **$k^{wh}e$-*)				
Interrogative	**$k^{wh}a$-* (~ **$k^{wh}ə$-*)	**ḳo*	**Ḳo*	**k*	**k*
Interrogative -relative	**ʔay-*, **ʔya-*	**ja*	**ya*	**j*	
Interrogative	**mi-*	**mi*	**mi*	**m*	
Relative	**ma-*				
Interrogative -relative	**na-*	**na*		**n*	
Indefinite	**ma-*, **mi-*, **mu-*	**mu*			
Indefinite	**$d^y i$-* (~ **$d^y e$-*)				

10. Nominal Morphology

10.1. Introduction

The overall structure of nominals (nouns and "adjectives") was as follows:

Root (+ derivational suffix) + terminal vowel (*a, *i, *u)
(+ relational marker) (+ number marker)

A stem could consist of the unextended root (**CVC-*) or the root extended by a single derivational suffix (**CVC+C-*). As noted above, it is necessary to recognize two distinct periods of development in Proto-Nostratic. In the earliest phase of development, the relational markers listed below were free relational morphemes (postpositional particles). In later Proto-Nostratic, however, at least two of them were well on their way to becoming bound relational morphemes (case suffixes).

As just stated, only the following two bound relational markers (case suffixes) can be confidently reconstructed for the latest period of Proto-Nostratic: (a) direct object **-ma*, **-na* and (b) genitive **-nu*. Other case relationships were expressed by postpositions (see below for a list), some of which developed into bound case morphemes in the individual daughter languages. This is confirmed by Dravidian, where only the accusative (**-ay*, **-Vn*), dative (**-kk-*/**-k-*), and genitive (**-a*, **-in* [< **-i* + **-nu*]) can be confidently reconstructed for the Dravidian parent language (cf. Krishnamurti 2003:227; Steever 1998a:20 [Steever adds nominative **-Ø*]).

Other case forms developed in the Dravidian daughter languages (for discussion, cf. Krishnamurti 2003:227—243). Likewise, only the following two grammatical cases can be reconstructed for Proto-Uralic (cf. Abondolo 1998a:18; Raun 1988:558—559): (a) accusative *-*m*, which probably was used to mark the definite direct object of finite verbs, and (b) a subordinate suffix *-*n*, which functioned as a genitive/nominalizer with nouns and as an adverb formant with verbs. Abondolo (1998a:18) further points out that there were also at least three local cases in Proto-Uralic: (a) locative *-*nA*, (b) separative *-*tA* ~ *-*tI*, and (c) and perhaps the latives *-*k* (and/or *-*ŋ*) and *-*t*^{y} (traditional *-*ć*) (and/or *-*n*^{y} [traditional *-*ń*]). Sinor (1988:714—725) devotes considerable attention to the question of common case markers between Uralic and Altaic. He, too, posits a Proto-Uralic accusative in *-*m* and a genitive in *-*n*. For the former, he notes that nothing comparable can be posited for Proto-Turkic or Proto-Mongolian, but he does reconstruct a Proto-Tungus accusative *-*m*, which is in agreement with what is found in Uralic. The clearest parallels for the latter are to be found in the Proto-Mongolian genitive *-*n* (cf. Poppe 1955:187—194) and in the Proto-Turkic genitive *-*n* (cf. Róna-Tas 1998:73). Poppe (1955:187—194) mentions that the genitive and accusative have converged in some Mongolian languages. This seems to indicate that Proto-Mongolian may have preserved the *-*n* variant accusative form as opposed to the *-*m* variant found in Uralic and Tungus. Sinor (1988:715—725) also discusses the Uralic and Altaic parallels between various local cases. Finally, it is worth mentioning here that, within Afrasian, Zaborski (1990:628) tentatively reconstructs the following case morphemes for Proto-Omotic: (a) nominative *-*i*, (b) genitive-instrumental-directional *-*kV*, (c) dative *-*s*, (d) dative-comitative *-*rV*, (e) accusative *-*a* and *-*nV*, (f) instrumental-locative-directional-dative *-*nV*, and (g) ablative *-*pV*. Zaborski (1990:618) notes that some of these case forms may go back to earlier postpositions. Parallels with Cushitic show that at least some of these case forms go back to Proto-Afrasian. Diakonoff (1988:61) notes that the following cases can be established for Proto-Afrasian with reasonable certainty: (a) *-*Vš*, *-*šV* locative-terminative; (b) *-*dV*, *-*Vd* comitative, dative; (c) *-*kV* ablative and comparative; (d) *-*Vm* locative-adverbialis; (e) *-*l* directive; and (f) *-*p* (also *-*f*) ablative (in Omotic — conjunction, demonstrative pronoun in other languages). The ultimate Nostratic origin of several of the case forms posited by Zaborski for Proto-Omotic and by Diakonoff for Proto-Afrasian is completely transparent.

In Proto-Nostratic, adjectives did not exist as a separate grammatical category. They were differentiated from nouns mainly by syntactical means — a noun placed before another noun functioned as an attribute to the latter. Moreover, they did not agree with the head noun in number or gender. Caldwell (1913:308—318) describes similar patterning for Dravidian: "…adjectives have neither number, gender, nor case, but are mere nouns of relation or quality, which are prefixed without alternation to substantive nouns". Krishnamurti (2003:389) points out, however, that not all Dravidian adjectives are of the derived types described by Caldwell. Krishnamurti considers adjectives to form a separate part of speech in Dravidian, as does Zvelebil (1977:59—69 and 1990:27—28), though Zvelebil mentions the fact that primary, underived adjective stems are statistically very rare

in the Dravidian daughter languages. According to Steever (1998a:19): "The reconstruction of further parts of speech such as adjectives and adverbs to the proto-language is controversial. While some scholars have projected the category of adjectives to Proto-Dravidian, many of the candidates for adjectival status appear to be defective nouns or verbs. Although the scholarly literature speaks of certain forms as having adjectival function, viz., modifying a nominal, conclusive evidence that those forms constitute a formally distinct class is largely lacking. Further, none of the putative adjectives in Dravidian exhibits a comparative or superlative degree. These degrees are expressed instead by syntactic means…" (see also Andronov 2003:180 and 300). As for Elamite, Khačikjan (1998:17) notes: "There was no special class of adjectives in Elamite. The mechanism of forming adjectives was the same as that used to express attributive relationships." According to Diakonoff (1988:57), adjectives did not form a separate grammatical category in Proto-Afrasian, and this appears to have been the situation in Proto-Berber (cf. Kossmann 2012:34) and probably Proto-Cushitic (cf. Mous 2012:359) as well. Likewise in Proto-Uralic (cf. Abondolo 1998a:18): "Nouns were probably not morphologically distinct from adjectives in proto-Uralic, although the distribution of the comparative suffix *=mpV suggests that an adjective category may have been developing before the breakup of Finno-Ugric". In later Proto-Indo-European, on the other hand, adjectives formed a distinct grammatical category, and they agreed with the head noun in number and gender (for details and examples, cf. Szemerényi 1996:192—202; Beekes 1995:196—200 and 2011:219—223; Fortson 2010:134—136; Meillet 1964:408—409; Meier-Brügger 2003:218—223). Adjectives also form a separate part of speech in the Kartvelian languages. In Turkic, adjectives are not usually clearly distinguished from nouns morphologically. However, several suffixes are used primarily to form adjectives. In Modern Mongolian, there is no difference between adjectives and nouns. A noun placed before another noun functions as an attribute to the latter (cf. Grønbech—Krueger 1993:18). In Gilyak / Nivkh, adjectives do not exist as a distinct word-class, the semantic function of adjectives being performed by qualitative verbs (cf. Gruzdeva 1998:16).

10.2. Relational Markers

Direct object: *-*ma*
Direct object: *-*na*
Possessive: *-*nu* 'belonging to'
Possessive: *-*lV* 'belonging to'
Dative: *-*na* 'to, for'
Directive: *-*k^ha* 'direction to or towards, motion to or towards'
Directive(-locative): *-*ri* 'direction to or towards, motion to or towards' (?)
Locative: *-*ni* 'the place in, on, or at which something exists or occurs'
Locative, instrumental-comitative: *-*ma* 'in, from, with'
Locative: *-*bi* 'in addition to, together with'
Locative: *-*i* 'near to, near by' (?)
Comitative-locative: *-*da* 'together with'

Oblique: *-$t^h a$

The following table correlates the reconstructions for the Proto-Nostratic relational markers proposed in this paper (A) with those proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Direct object	*-*ma*	*-*mʌ*	*-*mA*	*-*m*	*-*m*
Direct object	*-*na*				
Possessive	*-*nu*	*-*n*	*-*nu*	*-*n*	*-*n*
Possessive	*-*lV*			*-*l*	
Dative	*-*na*				*-*nV*
Directive	*-$k^h a$	*-k_{Λ}	*-*ḴV* [= *-*ḳV* ?]	*-*ka* Dative	*-*ka* Dative
Directive(-locative)	*-*ri*			*-*ru*	*-*rV*
Locative	*-*ni*	*-*na*		*-*n*	*-*nV*
Locative, instr.-comit.	*-*ma*			*-*m*	
Locative	*-*bi*			*-*bh-*	
Locative	*-*i*			*-*i*	
Comitative-locative	*-*da*	*-*da* Loc.	*-*d[E]H_1a*	*-*ta* Locative	*-*du*, *-*da* (Altaic)
Oblique	*-$t^h a$	*-t_{Λ} Instr.		*-*ta* Ablative	*-*t* Ablative

10.3. Dual and Plural Markers

Dual: *$k^h i$(-nV)
Plural: *-$t^h a$
Plural: *-*ri*
Plural: *-$k^h u$
Plural (Eurasiatic only): *-*sV*
Plural/collective: *-*la*
Plural: *-*nV*

The following table correlates the reconstructions for the Proto-Nostratic dual and plural markers proposed in this paper (A) with proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Dual	*$k^h i$(-nV)		*-*q̇V*	*-*ki*[n]	*-*ki*
Plural	*-$t^h a$	*-*t*	*-*tV*	*-*t*	*-*t*
Plural	*-*ri*		*-*r*[i]	*-*ri*	
Plural	*-$k^h u$		*-*kU*	*-*ku*	

	A	B	C	D	E
Plural (Eurasiatic only)	*-*sV*			*-*s*	
Plural/collective	*-*la*	*-*lA*	*-*l̡A*	*-*l*	
Plural	*-*nV*	*-*nA*	*-*n[ä]*	*-*n*	

10.4. Derivational Suffixes

Nominalizer: *-*r*-
Nominalizer: *-*m*-
Nominalizer: *-*y*-
Nominalizer: *-*t^h*-
Nominalizer: *-*n*-
Nominalizer: *-*l*-
Nominalizer: *-*k^h*-
Nominalizer: *-*k'*-

Note: No doubt, there were additional derivational suffixes in Proto-Nostratic. Indeed, it appears that any consonant could serve as a derivational suffix. Ehret (1995:15—54) lists and discusses a great variety of nominal and verbal extensions in Afrasian, while Starostin—Dybo—Mudrak (2003:173—220) do the same for Altaic (see Chapter 18 for details). For a comprehensive, though dated, treatment of Indo-European derivational morphology, cf. Brugmann—Delbrück 1897—1916, vol. II/1, and Brugmann 1904:281—354, and for Uralic, cf. Collinder 1960:255—281 and Décsy 1990:58—66.

10.5. Noun Morphology in the Daughter Languages

In an important study, Leonid Kulikov (2009) discusses the various ways in which new cases can arise; specifically, he lists five main mechanisms (2009:439):

> New cases may arise (i) by adding adverbs, postpositions, and (rarely) prepositions (see section 28.1.1); (ii) by adding existing case markers to other case forms, which results in 'multilayer' case marking (see 28.1.2); (iii) from demonstrative pronouns or articles (see 28.1.4). New case forms may also go back to (iv) denominal adjectives and adverbials incorporated into the case paradigm (see 28.1.3). An important mechanism of the rise of new case(s) is (v) splitting of one case into two by borrowing of a new case marker from a different declension type (see 28.1.5).

These were the very mechanisms that were at work in the development of the case systems found in the various Nostratic daughter languages. Here, we may cite the paper entitled "Indo-European Nominal Inflection in Nostratic Perspective" (2014) by Václav Blažek, in which he shows that the same mechanisms were at work in the prehistoric development of the Proto-Indo-European case system (2014:35):

> Aharon Dolgopolsky (2005: 35) used to wonder if the original grammatical structure of Nostratic was synthetic or analytic. The present analysis of the Indo-European nominal inflection in Nostratic context confirms his preference of the analytic structure, with regard to the fact that most of the Indo-European case endings are derivable from various deictic or adverbial particles, some on the Indo-European level (usually with Nostratic roots), e.g. loc. sg. in *-*en*- (Skt. *udán*) vs. *H_1*en*- "in", others on the Nostratic level at least, e.g. loc. pl. in *-*su* vs. Kartvelian **šuwa*- "in the middle" or Central Cushitic **šəw*- "heart" (Dolgopolsky 2005: 17—19).

As far back as 1958, Winfred P. Lehmann had proposed a similar model regarding the early development of the Proto-Indo-European case system.

Janhunen (1982:30) reconstructs the following case endings for Proto-Uralic (cf. also Austerlitz 1968:1378—1379; Collinder 1960:282—297 and 1965:54—57; Hajdú 1972:41; Abondolo 1998a:18; Décsy 1990:68—72; Raun 1988:558—560; Cavoto 1998:26; Marcantonio 2002:206; John C. Kerns [in Bomhard—Kerns] 1994:172—173, §3.5.3):

		Singular	Plural
Grammatical Cases	Absolutive (Nominative)	*-*Ø*	*-*t*
	Genitive	*-*n*	*-*j*
	Accusative	*-*m*	
Local Cases	Locative	*-*nå*/-*nä*	
	Ablative	*-*tə*	
	Dative	(?) *-*kə*, *-*ŋ*	

According to Abondolo (1998a:18), there were at least two grammatical cases in Proto-Uralic: an accusative *-*m* and a subordinate suffix *-*n*, which functioned as a genitive/pronominalizer. There were at least three local cases: a locative *-*nA*, a separative **tA* ~ **tI*, and perhaps the latives *-*k* (and/or *-*ŋ*) and *-t^y (and/or *n^y). See Nichols 1973 for a discussion of suffix ordering in Proto-Uralic.

In an important study in which he argues forcefully and persuasively for a genetic relationship between Uralic and Yukaghir, Merlijn De Smit (2017, §2.8 and §5) tentatively reconstructs the following case endings for Proto-Uralo-Yukaghir — he does not reconstruct plural endings:

	Singular	Plural
Nominative	*-*Ø*	(?)
Genitive	*-*n*	
Locative 1 ("Proximal")	*-*me*	
Locative 2 ("Distal")	*-*na*	
Ablative	*-*ta*	
Lative	*-*ka*	

At this point, it is interesting to compare the case endings (properly, tightly bound postpositions) reconstructed for Proto-Dravidian by Zvelebil (1977:33) (see also Krishnamurti 2003:217—243; Steever 1998a:20—21; Caldwell 1913:252—308 — Caldwell also notes parallels with Uralic):

Nominative	*-*Ø* and, possibly, *-*m*/*-*n* with non-personal substantives
Accusative	*-*(V)n*
Genitive	*-*in* (adnominal); *-*atu* (pronominal); *-*ă̆* (possessive)
Dative	*-*(k)ku*
Instrumental	*-*ān*/*-*āl*
Ablative	*-*in* (?)
Locative	*-*uḷ*; *-*in*/*-*il* (?); *-*kaṇ*
Sociative (Comitative)	*-*ŏ̆ṭu* or *-*(t)-ŏ̆ṭu* < **tŏ̆ṛV* (?)

This system can be derived from an earlier, simpler system, as is shown by comparison with Elamite (cf. McAlpin 1981:108—112). Clearly, several of the endings must have had a common origin (such as the genitive ending *-*in*, the ablative *-*in*, and the locative *-*in*[/*-*il*]). McAlpin (1981:111) reconstructs the following case endings for Proto-Elamo-Dravidian:

Nominative	*-*Ø*
Accusative	*-*(V)n*
Adessive/ Purposive (Dative)	*-*əkkə* (?)
Genitives:	
1. Possessive	*-*a*
2. Adnominal	*-*in*
3. Oblique/Locative	*-*tə*

McAlpin (1981:109) notes:

> The so-called cases in both Elamite and Dravidian are merely tightly bound postpositions with no immediately available lexical source.

According to Ramstedt (1952—1957.I:25—27), Greenberg (2000:133—135), and Poppe (1955:187—191), a genitive in *-*n* also existed in Proto-Altaic. This ending is still found in several Mongolian and Turkic languages, though the Turkic forms vary between -*n* and -*ŋ*. However, Sinor (1988:715) cautions that it is premature to assume a Common Altaic genitive in *-*n*, though "… there can be little or no doubt concerning the identity of the -*n* genitive suffix actually attested in some Uralic, Turkic, Mongol, and Tunguz languages."

To fill out the picture, let us look at the case endings traditionally reconstructed for Late Proto-Indo-European, that is, for the stage of development immediately prior to the emergence of the non-Anatolian Indo-European daughter languages (cf. Adrados—Bernabé—Mendoza 1995—1998.II:45—94; Beekes 2011:185—217; Brugmann 1904:373—399; Clackson 2007:92—100; Fortson 2010:113—139; Hirt 1921—1927.3:33—81; Lundquist—Yates 2017:4; Meier-Brügger 2003:195—199; Meillet 1964:292—300; Schmalstieg 1980:46—87; Schmitt-Brandt 1998:180—220; Shields 1982; Sihler 1995:248—256; Szemerényi 1996:157—192; Watkins 1998:65—66) (the following table is a composite from multiple sources and aims to be as comprehensive as possible; some of the reconstructions are more certain than others):

Case	Singular	Plural	Dual
Nominative	*-*s*, *-*Ø*	*-*es*	} *-*e*, *-*ī*/*-*i*
Vocative	*-*Ø*	*-*es*	
Accusative	*-*m*/*-*m̥*	*-*ns*/*-*n̥s*	
Genitive	*-*es*/*-*os*/*-*s*	*-*om*/*-*ōm*	*-*o̯us* (?), *-*ōs* (?)
Ablative	*-*es*/*-*os*/*-*s*; *-*ed*/*-*od*	*-*bh(i̯)os*, *-*mos*	*-*bhi̯ō*, *-*mō*
Dative	*-*ei̯*	*-*bh(i̯)os*, *-*mos*	*-*bhi̯ō*, *-*mō*
Locative	*-*i*	*-*su*	*-*o̯u*
Instrumental	*-*e*/*-*o*; *-*bhi*, *-*mi*	*-*ōi̯s*; *-*bhis*, *-*mis*	*-*bhi̯ō*, *-*mō*

Missing from this table is the thematic nominative-accusative neuter singular ending *-*m* — this form is to be derived from the accusative singular ending. The *-*b*^{h}- and *-*m*- endings found in several of the concrete cases are usually considered to be late additions, and some have even questioned whether or not they should even be posited for the Indo-European parent language. They are not found in Hittite. No doubt, these endings were originally adverbs that were gradually incorporated into the case system, with some daughter languages choosing *-*b*^{h}- and others choosing *-*m*-. They should not be reconstructed as case endings at the Proto-Indo-European level. In like manner, the genitive plural probably arose from the accusative singular, while the genitive singular and nominative singular endings in *-*s* must have had a common origin — these endings later spread from the genitive singular to the ablative singular. The dual was a late addition, while the plural originally had a reduced set of endings compared to what was found in the singular — this is the picture that emerges when the Hittite and other Anatolian data are brought into consideration. We may note here that the Proto-Uralic ablative ending *-*ta* and the Proto-Elamo-Dravidian oblique/locative ending *-*tə* are most likely related to the Anatolian instrumental singular endings within Indo-European: Hittite -*it*, -*et*, (rare) -*ta*; Palaic -*az*; Luwian -*ati*; Lycian -*adi*, -*edi*; Lydian -*ad*.

In his book *Indo-European Prehistory*, John C. Kerns (1985:109—111) devotes considerable attention to describing an oblique-*n* marker, which he claims is a major component in Indo-European heteroclitic stems, and he elaborates upon his ideas in his treatment of Nostratic declension in Bomhard—Kerns (1994:173—179, §3.5.3.1). He notes that this oblique-*n* is the source of the *-n* found in the genitive, ablative, and instrumental case endings in Dravidian — it is also found in the genitive, dative-lative (palatalized before a front vowel), and locative case endings in Uralic. Kerns even finds traces of this oblique-*n* in Eskimo and Japanese. Thus, this is a widespread and ancient feature. Greenberg (2000:130) also discusses this ending (see also Cavoto 1998:26):

> There is an *-n* genitive in Eurasiatic that frequently serves as a marker of the oblique case along with more specific indicators of location, instrument, etc. When this occurs it invariably precedes the specific indicator. In certain cases it has also spread to the nominative.

11. Verbal Morphology

11.1. Introduction

In Proto-Nostratic, verbs fell into two types of construction: (1) active and (2) stative. In active constructions, which usually involved transitive verbs, the grammatical subject of the verb represented the agent performing the action, and the direct object represented the patient, or recipient, of the action (cf. Trask 1993:5). Stative constructions, on the other hand, expressed a state of affairs, rather than an event (cf. Trask 1993:259). Verbs expressed aspectual contrasts rather than temporal contrasts. Tense relates the time of the situation referred to to some other time, usually to the moment of speaking (cf. Comrie 1976:1—2), while aspect marks the duration or type of temporal activity denoted by the verb (cf. Crystal 1992:29; Comrie 1976:3). Proto-Nostratic had two aspects: (a) perfective (past) and (b) imperfective (non-past). Here, we may note that Diakonoff (1988:85) posits two aspects for the earliest form of Proto-Afrasian: (a) punctive (instantaneous) and (b) durative (protracted, or continuous). He assumes that these later developed into perfective and imperfective aspects and then, eventually, in the individual Afrasian daughter languages, into past and present-future tenses. He does not posit tenses for the Afrasian parent language. Proto-Nostratic had, at the very least, the following moods: (a) indicative; (b) imperative; (c) conditional; (d) inchoative; (e) hortatory-precative; and (f) prohibitive. In addition to a causative marker **-sV*, there may also have been valency-changing markers.

The overall structure of verbs was as follows:

Root + formative vowel (*a, *i, *u) (+ derivational suffix)
(+ mood marker) (+ person marker) (+ number marker)

A stem could consist of the unextended root or the root extended by a single derivational suffix (preceded, as indicated above, by a formative vowel). The position of the number marker seems to have been flexible — it could also be placed before the person marker. Gender was not marked. There were no prefixes in Proto-Nostratic. We may note here that Krishnamurti (2003:279 and 312) posits the following structure for verbs in Proto-Dravidian:

Stem + tense-mood + (gender-)number-person marker

Paper (1955:44) analyzes the Royal Achaemenid Elamite verb structure as follows:

1 2 3 4 5
Verb base + stem vowel + tempus + person + mode

Stative verbs were indifferent to number and, therefore, had no plural forms. They also had a special set of person markers different from those of active verbs:

	Active		Stative
Person	Singular	Plural	Singular only
1	*-*mi* *-*na*	*-*ma* (inclusive) (+ plural marker) *-*na* (exclusive) (+ plural marker)	*-*k^ha* *-*ħa*
2	*-*t^hi* *-*si* *-*ni*	*-*t^hi* (+ plural marker)	*-*t^hi*
3	*-*ša* (~ *-*šə*) *-*na*, *-*ni*	*-*ša* (~ *-*šə*) (+ plural marker) *-*na*, *-*ni* (+ plural marker)	*-*Ø*

Morphologically, verbs could be either finite or non-finite. Finite forms could be marked for aspect, mood, person, and number, but not for gender or tense. Non-finite forms exhibited nominal inflection. In unmarked word order, the verb occupied the end position of a clause (see above, §8. Rules of Proto-Nostratic Syntax).

11.2. Non-finite Verb Forms

The following non-finite verb forms are widespread enough in the Nostratic daughter languages to guarantee their common origin, and, consequently, they are listed separately here. However, at the Proto-Nostratic level, they were indistinguishable from the nominalizing suffixes listed above.

Participle: *-*n*-
Participle: *-*t^h*-
Gerundive-participle: *-*l*-

The following table correlates the reconstructions for the Proto-Nostratic non-finite verb forms proposed in this paper (A) with those proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Participle	*-*n*-		*-*n̄V*	*-*n*	*-*n*
Participle	*-*t^h*-		*-*ṭV*	*-*t*	*-*t*
Gerundive-participle	*-*l*-			*-*l*	*-*l*

Note: Greenberg (2000:182—186, no. 44) also posits a participle in *-*nt*- for Proto-Eurasiatic on the basis of reflexes found in Indo-European, Finno-Ugrian, and Gilyak / Nivkh. However, this is best seen as a compound suffix: *-*n*- + *-*t^h*-.

11.3. Finite Verb Forms: Mood Markers

Indicative: unmarked
Imperative: *-*k^ha*, *-*k^hi*, *-*k^hu*; *-*a*, *-*i*, *-*u* (< *-*ʔa*, *-*ʔi*, *-*ʔu*)
Conditional: *-*ba*
Hortatory-precative: *-*li*
Inchoative: *-*na*

Note: The bare stem could also serve as imperative, in which case the vowels *-*a*, *-*i*, or *-*u* were added to the stem. These were different than the formative vowels (aspect markers) previously discussed. Ultimately, they may go back to the deictic particles (A) *-*ʔa*- (~ *-*ʔə*-) (distant), (B) *-*ʔi*- (~ *-*ʔe*-) (proximate), and (C) *-*ʔu*- (~ *-*ʔo*-) (intermediate).

The following table correlates the reconstructions for the Proto-Nostratic mood markers proposed in this paper (A) with those proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Imperative	*-*k^ha*, *-*k^hi*, *-*k^hu*		*-*kV* ~ *-*gV*	*-*ka*	
Conditional	*-*ba*			*-*p*	
Hortatory-precative	*-*li*			*-*l*	
Inchoative	*-*na*				

11.4. Finite Verb Forms: Others

Causative: *-*sV*

The following table correlates the reconstruction for the Proto-Nostratic causative marker proposed in this paper (A) with that proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Causative	*-*sV*			*-*s*	

11.5. Verb Morphology in the Daughter Languages

Comparison of the various Nostratic daughter languages reveals many striking similarities in verb morphology. This comparison, for example, allows us to ascertain the ultimate origin of the athematic verb endings in Proto-Indo-European: they can be nothing other than possessive suffixes similar to what are found in Proto-Uralic and Proto-Altaic. Ultimately, these possessive suffixes had a pronominal origin. The earliest forms of the athematic endings in Proto-Indo-European may have been as follows (cf. Bomhard 1988; see also Villar 1991:244—252; for details, cf. Bomhard 2018, Chapters 19 and 20):

Person	Singular	Plural
1	*-*m*	*-*me*
2	*-*t*^{h}	*-*t*^{h}*e*
3	*-*s*, *-*Ø*	*-*en*

This earlier system may be partially preserved in Tocharian A, where the athematic endings are as follows:

Person	Singular	Plural
1	*-(ä)m*	*-mäs*
2	*-(ä)t*	*-c*
3	*-(ä)ṣ*	*-(i)ñc*

Note: There are phonological problems with the 3rd singular ending *-(ä)ṣ* in Tocharian — had this been inherited directly from Proto-Indo-European *-*si*, we would expect *-(ä)s*, not *-(ä)ṣ*. The best explanation is that of Pedersen, who derived this ending from an enclitic *-*se*-.

Traces of the earlier system are also found in the Anatolian languages. Note, for example, the Hittite 2nd singular active preterite ending *-ta*.

Now compare the following system of personal endings, which are assumed to have existed in Proto-Uralic (cf. Hajdú 1972:40 and 43—45; Cavoto 1998:127; Collinder 1965:134—135; Décsy 1990:66—68; Sinor 1988:725):

Person	Singular	Plural
1	*-*me*	*-*me* (+ Plural)
2	*-*te*	*-*te* (+ Plural)
3	*-*se*	*-*se* (+ Plural)

Traces of these endings are found in the Altaic languages as well. Sinor (1988:725) reconstructs the following possessive suffixes for Proto-Turkic and Proto-Tungus:

Proto-Turkic:

Person	Singular	Plural
1	*-*m*	*-*m* (+ Plural)
2	*-*ŋ*	*-*ŋ* (+ Plural)
3	*-*s*	*Ø

Proto-Tungus:

Person	Singular	Plural
1	*-*m*	*-*m* (+ Plural) (excl.)
2	*-*t*	*-*t*
3	*-*n*	*-*t*

It may be noted here that Common Mongolian did not have special verbal endings to indicate person or number. However, at a later date, personal pronouns were added enclitically to the verbal forms (cf. Poppe 1955:251).

In an unpublished paper entitled "Cross-Bering Comparisons", Stefan Georg lists the following possessor suffixes in "Uralo-Eskimo", Samoyed, and Eskimo-Aleut (see also Seefloth 2000):

	Uralo-Eskimo		Samoyed		Eskimo-Aleut	
	Singular	Plural	Singular	Plural	Singular	Plural
1sg	*-m*	*-t-m*	*-mə*	*-t-mə*	*-m-(ka)*	*-t-m-(ka)*
2sg	*-t*	*-t-t*	*-tə*	*-t-tə*	*-n/t*	*-tə-n/t*
3sg	*-sa*	*-i-sa*	*-sa*	*-i-sa*	*-sa*	*-i-sa*
1pl	*-mə-t*	*-n/t-mə-t*	*-ma-t*	*-t/n-ma-t*	*-mə-t*	(= sg.)
2pl	*-tə-t*	*-t-mə-t*	*-ta-t*	*-t-ta-t*	*-tə-t*	(= sg.)
3pl	*-sa-t*	*-i-sa-t*	*-i-to-n*	*-to-n*	*-sa-t*	*-i-sa-t*

The personal endings survive in Elamite as well, especially in the 2nd and 3rd persons (by the way, the Elamite 1st singular ending, *-h*, is, of course, related to the 1st singular perfect ending *-*ḫ₂e* of traditional Proto-Indo-European, which is found, for example, in Luwian in the 1st singular preterite ending *-ḫa*, in Hittite in

the 1st singular ending *-ẖi*, and in Greek in the 1st singular perfect ending *-α*; this ending may also be related to the Proto-Kartvelian 1st person personal prefix of the subject series, **xw-* [Gamkrelidze—Mačavariani 1982:85 reconstruct **w-* here, however], as suggested by Ivanov and Palmaitis) — compare, for example, the conjugation of *hutta-* 'to do, to make' from Middle Elamite (cf. Reiner 1969:76; Grillot-Susini 1987:33):

Person	Singular	Plural
1	*hutta-h*	*hutta-hu* (< *-h+h*)
2	*hutta-t*	*hutta-ht* (< *-h+t*)
3	*hutta-š*	*hutta-hš* (< *-h+š*)

Traces of the 2nd singular ending are also found in Dravidian — McAlpin (1981:120) reconstructs Proto-Elamo-Dravidian 2nd person ending **-ti* (> Proto-Elamite **-tə*, Proto-Dravidian **-ti*). This is a significant archaism, since it bears no apparent resemblance to the common Elamo-Dravidian 2nd person personal pronoun stem, which McAlpin (1981:114—115) reconstructs as **ni* and which may be an innovation (cf. Dolgopolsky 1984:87—88 and 100; Dolgopolsky posits Proto-Elamo-Dravidian **nün*, which he derives from **ṭün* through assimilation), though Greenberg (2000:76—77) discusses the possibility that there may have been a second person pronoun stem **nV* in Eurasiatic.

Traces of these endings are also found within Afrasian in Highland East Cushitic, where the suffixes of the simple perfect in Gedeo / Darasa, Hadiyya, Kambata, and Sidamo are as follows (cf. Hudson 1976:263—264):

Person	Gedeo / Darasa	Hadiyya	Kambata	Sidamo
1 sg.	*-enne*	*-ummo*	*-oommi*	*-ummo*
2 sg.	*-tette*	*-titto*	*-toonti*	*-itto*
3 sg. m.	*-e*	*-ukko*	*-o(ʔi)*	*-í*
3 sg. f.	*-te*	*-toʔo*	*-too(ʔi)*	*-tú*
3 sg. pol.	—	*-aakkoʔo*	*-semma(ʔi)*	*-ní*
1 pl.	*-nenne*	*-nummo*	*-moommi*	*-nummo*
2 pl.	*-tine*	*-takkoʔo*	*-teenta(ʔi)*	*-tiní*
3 pl.	*-ne*	*-toʔo*	*-too(ʔi)*	*-tú*

While the suffixes of the present perfect in Hadiyya, Kambata, and Sidamo are as follows (cf. Hudson 1976:264—265):

Person	Hadiyya	Kambata	Sidamo
1 sg.	*-aammo*	*-eemmi*	*-oommo*
2 sg.	*-taatto*	*-tenti*	*-otto*
3 sg. m.	*-aakko*	*-eeʔi*	*-inó*
3 sg. f.	*-taʔokko*	*-teeʔi*	*-tinó*

Person	Hadiyya	Kambata	Sidamo
3 sg. pol.	*-aakkaʔokko*	*-eemma(ʔi)*	*-noonni*
1 pl.	*-naammo*	*-neemmi*	*-noommo*
2 pl.	*-takkaʔokko*	*-teenta*	*-tinonni*
3 pl.	*-taʔokko*	*-teeʔi*	*-tinó*

The suffixes of the imperfect are as follows (cf. Hudson 1976:265):

Person	Gedeo / Darasa	Hadiyya	Kambata	Sidamo
1 sg.	*-anno*	*-oommo*	*-aammi*	*-eemmo*
2 sg.	*-tatto*	*-tootto*	*-taanti*	*-atto*
3 sg. m.	*-aani*	*-ookko*	*-ano*	*-anno*
3 sg. f.	*-taani*	*-tamo*	*-taaʔi*	*-tanno*
3 sg. pol.	—	*-aakkamo*	*-eenno*	*-nanni*
1 pl.	*-nanno*	*-noommo*	*-naammi*	*-neemmo*
2 pl.	*-tinaa*	*-takkamo*	*-teenanta*	*-tinanni*
3 pl.	*-naani*	*-tamo*	*-taaʔi*	*-tanno*

The suffixes of the subordinate conjugation in Kambata and Sidamo are as follows (cf. Hudson 1976:270):

Person	Kambata	Sidamo
1 sg.	*-a*	*-a*
2 sg.	*-ta*	*-ta*
3 sg. m.	*-a*	*-a*
3 sg. f.	*-ta*	*-ta*
3 sg. pol.	*-eena*	*-na*
1 pl.	*-na*	*-na*
2 pl.	*-teena*	*-tina*
3 pl.	*-ta*	*-ta*

According to Ehret (1980:65), in Southern Cushitic, "[t]he basic person marking was constructed of the verb stem plus suffixes of the two shapes -V and -VCV, as the following comparison of West Rift and Dahalo conjugations indicates":

Person	Proto-SC	Burunge	Iraqw	Dahalo
1 sg.	**-o*	*-Ø*	*-Ø*	*-o*
2 sg.	**-ito*	*-id*	underlying **-it*	*-V̲to*
3 sg. m.	**-i*	*-i*	underlying **-i*	*-i*
3 sg. f.	**-ito*	*-id*	**-t*	*-V̲to*

Person	Proto-SC	Burunge	Iraqw	Dahalo
1 pl.	*-*anu*	-*an*	-*an*	-*Vnu*
2 pl.	*-*ite*	-*idey*	underlying *-*ta*	-*Vṯe*
3 pl.	*-*eye* and *-*iye*	-*ey*, -*i*	underlying *-*iya*, also -*ir*	-*ee*

Finally, Bender (2000:202) lists the following verbal affixes in the *ta/ne* (TN) branch of Omotic:

Person	NWO	SEO	C'	MO	G	Y	K	TN
1 sg.	**n*; *a*	*t(i)*	*e ?*	**n* ~ *t*	*u*	*an; ut*	**n*; **e*	—
2 sg.	*-; *a*	*n(i)*	*a ?*	**a*	*u/en*	*at+á;*	**i(n)*	—
3 sg.	*-; *i*	*(e)s*	*e ?*	**e* ~ *i*	*u*	*é; na*	**é*	**e*
3 sg. f.	**u*; *a*	*is*	—		*u*	*à*	**a*	**a*
1 pl.	**n*; *i*	*uni*	*i ?*	**ni*	*u*	*ni*	**o/u(n)*	**uni*
2 pl.	**et+i*; *i*	*t* ~ *n*	*i ?*	**ti*	*end*	*eti*	**ot*; **no*	**eti*
3 pl.	**on+a*; *i*	*usi*	*i ?*	**i*	*end*	*son+e*	**et*; **no*	**on-*

Abbreviations: NWO = Northwest Ometo; SEO = Southeast Ometo; C' = C'ara; MO = Macro-Ometo; G = Bench / Gimira; Y = Yemsa / Janjero; K = Kefoid; TN = *ta*/*ne* branch of Omotic.

The 1st person possessive suffix in *-*m* was thus common to Indo-European, part of Afrasian (Highland East Cushitic), Uralic, and, within Altaic, Turkic and Tungus, while the 2nd person in *-*t* was common to Indo-European, Uralic, Tungus, Elamo-Dravidian, and Afrasian, and the 3rd person in *-*s* was common to Indo-European, Uralic, Turkic, Elamite, and Kartvelian (cf. Old Georgian *c'er-s* 'writes'). The 3rd singular possessive suffix was *-*n* in Proto-Tungus, and this mirrors what is found in the 3rd plural in Indo-European and Kartvelian (cf. Old Georgian 3rd plural suffix -*en* in, for example, *c'er-en* 'they write', Mingrelian 3rd plural suffix -*an*, -*a*, -*n*, Laz 3rd plural suffix –*an*, -*n*), in Berber (cf. Kossmann 2012:44—47) and Beja / Beḍawye (cf. Appleyard 2007a:467), and partially in the 3rd singular and plural suffixes and Highland East Cushitic, with traces in Omotic (see above) and perhaps Semitic (R. Stempel [1999:105—106] takes the 3rd plural froms in *-*n(a)* to be late formations taken over from the 2nd plural, while Moscati [1964:140] suggests that they are due to analogy with certain personal pronouns) — there is also a parallel here in Sumerian (see Chapter 15). As noted by Fortescue (1998:99), it is also found in Chukchi-Kamchatkan:

> Although, as we have seen, C[hukchi-]K[amchatkan] does not have personal possessor affixes of the E[skimo-]A[leut] type, it seems that there are traces of a 3rd person possessor marker remaining, of the same type found in Yukaghir before case endings (to be discussed in 5.1.2). Thus the 3rd person marker -(ə)n is frozen into position following the stem in the 'Class 2' noun declension for

> definite, individualized persons (in Chukchi mainly proper names, elder kinship terms and some other animates, including nicknames for domestic reindeer and names of animals in myths).

Within Indo-European, the 2nd singular ending *-t^h is preserved in Hittite and Tocharian. This was later replaced by what had been the 3rd singular, namely, *-*s*. In his 1962 book entitled *Indo-European Origins of the Celtic Verb. I: The Sigmatic Aorist*, Calvert Watkins discusses the extensive evidence from the Indo-European daughter languages for an original 3rd singular ending in *-*s*. It was Watkins who also showed that the 3rd singular indicative was originally characterized by the fundamental ending *zero*. The *-*n*- found in the 3rd plural was a relic of the 3rd person ending found in Tungus, Kartvelian, and Sumerian. The development of the 3rd singular ending *-t^h was a later change, though this still occurred fairly early since it is found in Hittite and the other Anatolian daughter languages — this *-t^h was added to the 3rd plural ending *-*n*- at the same time, yielding the new ending *-nt^h-. This *-t^h probably had the same origin as the 3rd singular possessive suffix *-*t* found in Ugric and some of the Samoyed languages on the one hand and in the Proto-Tungus 3rd plural possessive suffix *-*t* on the other (cf. Sinor 1988:727—728). It is also found in Berber (cf. Tuareg 3rd person pronominal affix: [m. sg.] -*t*, [f. sg.] -*tət*; [m. pl.] -*tən*, [f. pl.] -*tənət*). The most recent change must have been the development of the so-called "primary" endings, which were built upon the so-called "secondary" endings by the addition of the deictic particle *-*i* meaning "here and now", as shown by Kerns and Schwartz (1972:4). It may be mentioned that this deictic particle had a Nostratic origin, coming from a widely-represented proximate demonstrative stem meaning 'this one here'.

Now, Proto-Uralic is assumed to have had two conjugational types (cf. Hajdú 1972:43—44; Collinder 1960:308): (A) a determinative (objective) conjugation, which was characterized by the 3rd singular in *-*s* and which was used with transitive verbs, and (B) an indeterminative (subjective) conjugation, which was characterized by the 3rd singular in *zero* and which was used with intransitive verbs. The same two conjugational types existed in Proto-Indo-European, except that the contrast was between active and stative. Indeed, the active ~ stative contrast appears to be the more ancient in both Proto-Uralic and Proto-Indo-European.

After all of the changes described above had taken place, the resulting Proto-Indo-European athematic endings were as follows (cf. Brugmann 1904:588—594; Beekes 1995:232—233; Burrow 1973:306—319; Szemerényi 1990:356—357 and 1996:327; Fortson 2010:92—93; Clackson 2007:123—125; Shields 1992; Meillet 1964:227—232; Watkins 1998:60; Meier-Brügger 2003:178; Sihler 1995:454; Adrados 1974.II:619—663; Ringe 2006:31):

	I. Primary		II. Secondary	
Person	Singular	Plural	Singular	Plural
1	*-*mi*	*-*me*	*-*m*	*-*me*
2	*-*si*	*-t^h*e*	*-*s*	*-t^h*e*
3	*-t^h*i*	*-nt^h*i*	*-t^h	*-nt^h

Note: The 1st person plural endings have different extensions in the various daughter languages: **-me-s(i)*, **-mo-s(i)*, **-me-n(i)*, **-mo-n(i)*. In these endings, the plural markers **-s* and **-n* have been added to **-me*/**-mo*. It may be noted that the plural marker **-n* is also found in Tungus — in Evenki, Even, Solon, Negidal, for example, the 2nd plural possessive suffix is made up of the 2nd singular possessive suffix plus the plural marker **-n* (cf. Sinor 1988:727).

In volume 1, Grammar, of his book *Indo-European and Its Closest Relatives: The Eurasiatic Language Family*, Greenberg (2000:67) discusses the evidence for a Eurasiatic first-person singular pronoun stem **k*. He writes:

> Less widely distributed than *m* for the first-person singular is *k*. Wherever they both appear, the general contrast is *m* as ergative versus absolutive *k*, *m* as active versus middle or passive *k*, and *m* as active versus stative *k*. I am inclined to believe that this last contrast is the basic one from which the others developed. A contrast of this kind between *m* and *k* seems to be attested only in the first-person singular.

Over the past quarter century or so, several scholars have tried to show that Indo-European is to be reconstructed as an active language (for a brief discussion, cf. Schwink 1994:86—87 and 89—110; see also Lehmann 2002). Indeed, such an interpretation seems to clarify many problems in the early dialects. According to this interpretation, the so-called "perfect" of traditional Indo-European is seen as originally stative (cf. Lehmann 1993:218 and 2002:169—172; see Bomhard 2018, Chapters 19 and 20, for details). Comparison with other Nostratic languages allows us to confirm this view.

The perfect reconstructed by the Neogrammarians for Proto-Indo-European was distinguished from the present and aorist by a unique set of personal endings in the indicative, namely, first person singular **-ə̯₂a* (cf. Sanskrit *véd-a* 'I know', Greek οἶδ-α, Gothic *wait*), second person singular **-tə̯₂a* (cf. Sanskrit *vét-tha* 'you know', Greek οἶσ-θα, and Gothic *waist*), third person singular **-e* (cf. Greek οἶδ-ε 'he/she knows', Sanskrit *véd-a*, and Gothic *wait*). Except for Armenian and Balto-Slavic, the perfect remained in all branches. It was least changed in Indo-Iranian, Celtic, and Germanic. In Greek, however, it was mixed up with a κ-formation and, in Italic, with a whole series of non-perfect tense forms. According to Greenberg, the perfect of traditional comparative grammar was originally stative in Proto-Indo-European, and, as noted above, others have recently made similar assertions. Sihler (1995:564—590) gives an excellent overview of the stative in Indo-European.

Now, Greek has a unique formation, the so-called "κ-perfect". However, this formation arose exclusively within prehistoric Greek. It is already found, to a limited extent, in Homer and in the earliest records of other dialects. In Homer, the formation is found in some 20 roots, all ending in a long vowel, and, in all of them, the κ-stem is virtually limited to the singular stems which actually contain a long vowel. Later, the formation spread to other stems ending in a long vowel, then to stems ending in any vowel (including denominatives), and finally to stems ending

in consonants, and to all persons and numbers. Thus, it is clear that we are dealing with developments specific to Greek itself. For a discussion of the Greek perfect, cf. Chantraine 1927; see also Kerns—Schwartz 1972:14.

In Latin, we find first singular perfect forms *fēcī* 'I did' and *iēcī* 'I threw'. As in Greek, the *-c-* [k] is found in all persons (cf. third singular *fecit*), and, as in Greek, the *-c-* [k] has given rise to secondary formations (such as *faciō* and *iaciō*, for example).

The *-k-* forms are also found in Tocharian, as in first singular preterite active *tākā-* 'I was', and, as in Greek and Latin, the *-k-* is found in all persons and has given rise to secondary formations. Van Windekens (1976—1982.I:495—496) goes so far as to posit Proto-Indo-European **dhēq-*, **dhə$_1$q-* as the source of Tocharian *tākā-* 'I was'.

On the basis of the evidence from Greek, Latin, and Tocharian, we may assume that a "suffix" **-k-* is to be reconstructed for late-stage Proto-Indo-European, that is, what I refer to as "Disintegrating Indo-European". This "suffix" originally had a very limited distribution — it seems to have appeared only in the perfect singular of verbs that ended in a long vowel, when the long vowel originated from earlier short vowel plus laryngeal. All of the other formations found in Greek, Italic, and Tocharian are secondary elaborations. But, we can go back even farther — we can speculate that the *-k-* originally characterized the first person exclusively, from which it spread to other persons. This suggestion is not new. Sturtevant (1942:87—88) suggested that **-k-* developed in the first person singular when a root-final laryngeal was followed by the ending **-xe* (that is, **-H$_2$e* [Kuryłowicz would write **-ə$_2$e*]). Though a laryngeal explanation along these lines has not been generally accepted (cf. Messing 1947:202—203), the suggestion that the *-k-* was originally confined to the first person singular is still a viable hypothesis, especially in view of the evidence from other Nostratic languages. Thus, both in function and form, the first singular **-k-* ending would belong with the Eurasiatic first person singular pronoun stem **k* reconstructed by Greenberg. It should be noted that this explanation is different than that given by Greenberg, who compares the Proto-Indo-European first person perfect (stative) ending **-Ha* with the **-k-* endings found in the other Eurasiatic languages. On purely phonological grounds, I find Greenberg's proposal less convincing than the alternative suggested here. Moreover, the first person perfect ending **-Ha* has a exact match in Elamite (see above), which clearly shows that it was inherited from Proto-Nostratic and, thus, not related to the **-k-* endings under discussion here.

12. Prohibitive/Negative Particles and Indeclinables

The following negative/prohibitive particles and indeclinables can be reconstructed for Proto-Nostratic:

Negative particles: **na*, **ni*, **nu*
Prohibitive particle: **ma(ʔ)*

Negative particle: **ʔal-* (~ **ʔəl-*)
Negative particle: **li* (~ **le*) (?)
Negative particle: **ʔe*
Post-positional intensifying and conjoining particle: **$k^{wh}a$-* (~ **$k^{wh}ə$-*)
Particle: **$k^{wh}ay$-* 'when, as, though, also'
Particle: **ħar^{y}-* 'or; with, and; then, therefore'
Particle: **ʔin-* (~ **ʔen-*), **(-)ni* 'in, into, towards, besides, moreover'
Sentence particle: **wa* (~ **wə*) 'and, also, but; like, as'
Coordinating conjunction: **ʔaw-*, **ʔwa-* (~ **ʔwə-*) 'or'

Note: The *CVC-* root structure patterning of some of these forms points to their ultimate nominal or verbal origin. For example, the negative particle **ʔal-* (~ **ʔəl-*) must ultimately have been a negative verb stem meaning 'to be not so-and-so', as in its Dravidian derivatives, while **ʔin-* (~ **ʔen-*), **(-)ni* was originally a nominal stem meaning 'place, location' (cf. Dolgopolsky 2008, no. 45, **ʔiñ[A]* 'place' [(in descendant languages) → 'in']).

13. Illič-Svityč's Views on Proto-Nostratic Morphology

Illič-Svityč never published his views on Nostratic morphology during his lifetime. However, his notes were gathered together and published by Vladimir Dybo in 2004 in the proceedings of the Pécs Centennial Conference, edited by Irén Hegedűs and Paul Sidwell. According to Illič-Svityč, Proto-Nostratic was an inflected language, apparently of the accusative type. It had both nouns and adjectives. Nominal declension was only available in the singular. Adjectives were declined only if they were substantivized and used independently. Illič-Svityč reconstructs the nominal paradigm as follows:

1. Nominative-accusative: **-Ø* (zero); used for subject and unmarked object;
2. Marked object: **-mʌ*; used if the object had to be topicalized in the sentence if the possibility existed for an ambiguous interpretation of the phrase and if a definite object was indicated;
3. Genitive (connective): **-n*; possessive, etc.;
4. Instrumental: **-tʌ*;
5. Local cases: Lative: **-ḳa*;
   Ablative: **-da*;
   Essive (locative): **-n*.

Plurality was primarily indicated by a special marker: **-t*. Illič-Svityč also reconstructs an oblique plural marker **-j*, though he notes that this is less certain.

Illič-Svityč reconstructs the following types of personal pronouns:

1. Independent pronouns — specifically for indicating the pronominal subject;

2. Forms of the subject standing by a verb, primarily in a position preceding a noun;
3. Forms of the direct object of a verb, primarily in a position preceding a noun after the form of the subject;
4. Possessive forms next to nouns, primarily in a position after a noun.

Only the first and second person singular and plural pronouns were represented in these four types.

Illič-Svityč reconstructs the following stems for these types:

1. Independent pronouns; these stems could be extended by a facultative emphatic element *-*na*:

   1st person singular: **ʌke-na*;
   2nd person singular: **ṭʌ-na*;
   1st person plural: **naHe-na*;
   2nd person plural: ?

2. Forms of the subject of verbs:

   1st singular: **a-*;
   2nd singular: **ṭa-*;
   1st plural: **na-*;
   2nd plural: ?

3. Forms of the direct object:

   1st singular: **mi-*;
   2nd singular: **k-*;
   1st plural: ?
   2nd plural: ?

4. Possessive forms:

   1st singular: **mi-*;
   2nd singular: **si-*;
   1st plural: **mʌn*;
   2nd plural: **sʌn*.

Illič-Svityč also posits the following demonstrative stems (fulfilling the function of 3rd person pronouns): **ṭa-*, **šä-*, **mu-*; the following interrogative stems: **ḳo* 'who?', **mi* 'what?'; and the following interrogative-relative stems: **ja*, **na* (?).

Illič-Svityč's views on verb morphology were not as well developed. He reconstructs an imperative as well as the following two opposing verb categories: (1) The first designated the action itself (transferred to the object in the case of

transitive verbs). This was used with the subject pronoun and (in the case of transitive verbs) with the object pronoun. Here, the nominal direct object was the marked form, and the verb stem coincided with the infinitive. (2) The other verb form was a derived noun ending in *-*a*. It indicated the state of the subject. If the verb were transitive, it contained only the prefix of the subject, and, in this case, the object noun could not be marked and thus always appeared in the subjective-objective case. Finally, Illič-Svityč suggests that there existed a temporal (or aspectual) distinction between these two basic verb categories, which was probably realized with the help of deictic particles of pronominal origin.

14. Dolgopolsky's Views on Proto-Nostratic Morphology

Dolgopolsky's views on Proto-Nostratic morphology differ from those of Illič-Svityč. According to Dolgopolsky (2005), Proto-Nostratic was a highly analytic language. Dolgopolsky notes that Illič-Svityč, although recognizing the analytical status of many grammatical elements in Proto-Nostratic, still believed that some of them were agglutinated suffixes, specifically, the marker of oblique cases *-*n* (= Dolgopolsky's **nu* 'of, from'), the formative of marked accusative *-*m[ʌ]* (= Dolgopolsky's **mA*), the plural marker *-*NA* (= Dolgopolsky's **n̄[ä]*, used to mark collectivity and plurality), and several others. Dolgopolsky points out that Illič-Svityč's position is unacceptable inasmuch as the Proto-Nostratic formants in question still preserve the following traces of their former analytic status: (1) mobility within a sentence (a feature of separate words rather than suffixes); (2) the fact that several particles are still analytic in some of the Nostratic descendant languages; and (3) the fact that Proto-Nostratic etyma with grammatical and derivational function are sometimes identical with "autosemantic words". Specifically, Dolgopolsky states (2008, pp. 26—27, §4. Grammatical Typology [lightly edited here]):

> As we can see, Proto-Nostratic was a highly analytic language. In this point, there is a certain disagreement between Illič-Svityč and myself. Illič-Svityč, albeit recognizing the analytical status of many grammatical elements in Nostratic, still believed that some grammatical elements were agglutinated affixes: the marker of oblique cases *-*n* (= my **nu* 'of, from'), the formative of marked accusative *-*m* (= my **mA*), the plural marker *-*NA* (= my **n̄[ä]* of collectiveness and plurality), and several others. This interpretation is hardly acceptable because the Nostratic etyma in question still preserve traces of their former analytic status: (1) they preserve some mobility within the sentence (a feature of separate words rather than affixes), (2) several Proto-Nostratic particles are still analytic in some descendant languages, (3) Nostratic etyma with grammatical and derivational function are sometimes identical with autosemantic words. Thus, the element **nu* 'of, from' functions in the daughter languages not only as a case suffix (genitive in Uralic, Turkic, Mongolian, Tungus, formative of the stem of oblique case in the Indo-European heteroclitic nouns, part of the ablative case ending in Turkic, Kartvelian, and in Indo-

> European adverbs), but also as a preverb of separation/withdrawal in Indo-European (Baltic), as an analytic marker of separation/withdrawal (ablative) in Baltic (functioning in post-verbal and other positions). The element **mA* is still analytic in Manchu (*be*, postposition of the direct object) and Japanese (Old Japanese *wɔ* > *Jo*). On the analytical status of *Jo* (< Nostratic **mA*), *no* (< N **nu*), cf. Vrd.JG 278-82. The element **n̄[ä]* functions not only as a post-nominal and post-verbal marker of plurality (> plural suffix of nouns in Kartvelian, Hamito-Semitic, and Altaic, ending of 3 pl. of verbs in Kartvelian, part of the Indo-European ending **-nti* ~ **-nt* of 3 pl.), but also as the initial marker of plurality or abstractness (← collectiveness) in Uralic and Egyptian pronouns: Finnish *nuo* (pl.) 'those' ↔ *tuo* (sg.) 'that', *ne* (pl.) 'those' ↔ *se* (sg.) 'that', Egyptian *nꜣ* abstract 'this' and 'these (things)' ↔ *pꜣ* 'this' (m.) ↔ *tꜣ* (f.). The animate plural deictic element (?) **yE* 'these, they' functions not only as the post-nominal marker of plurality (> plural ending in Indo-European, Uralic, Altaic, and Cushitic), but also as a pre-nominal and pre-pronominal plural marker (in Baltic, Beja, and Old English). The affix forming causative verbs in Hamito-Semitic may both precede the verbal root and follow it (e.g., in deverbal nouns), which points to an original analytic status of the corresponding Nostratic etymon. Hamito-Semitic **tw-* (prefix of reflexivization in derived verbs > Berber **tw-* → *t-* id., Semitic prefix and infix **/-/t-*, etc.) and the Anatolian Indo-European reflexive particle **-ti* (> Hieroglyphic Luwian *-ti* 'sich', Luwian *-ti*, Lycian *-ti*, reflexive particle, Hittite *z-*, *-za* id.) are etymologically identical with Nostratic **tVwV* 'head' (preserved with this meaning in Kartvelian and Omotic), which proves the analytic origin of the marker of reflexivization. In the descendant languages, most of these grammatical auxiliary words and some pronouns turned into synthetic affixes (agglutinative in Early Uralic and Altaic, inflectional [fusional] in Indo-European and, to a certain extent, in Hamito-Semitic and Kartvelian).

Though Dolgopolsky seems to be implying that nominative-accusative structure is to be reconstructed for Proto-Nostratic, grammatical typology is actually not discussed by him. Some of the daughter languages do, indeed, exhibit nominative-accusative structure (Proto-Uralic, Proto-Altaic, and later stages of Proto-Indo-European), but others exhibit ergative-absolutive structure (Proto-Kartvelian, Proto-Eskimo-Aleut, and Proto-Chukchi-Kamchatkan), and still others exhibit stative-active structure (Proto-Afroasiatic and probably Proto-Elamo-Dravidian [definitely Elamite]), with each of these different grammatical structures requiring a different type of clause alignment. No details are given as to how the inherited system was transformed into the systems found in the different daughter languages, nor is there any discussion of non-Nostratic languages or language families to show that the morphological structure being posited by Dolgopolsky for the Nostratic parent language has typological parallels in attested languages.

In actual fact, the type of grammatical structure that seems to be able to account best for the circumstances found in the Nostratic daughter languages is not nominative-accusative but, rather, stative-active, as explained earlier in this paper. As noted above, this type of grammatical structure was found in Proto-Afroasiatic and Proto-Elamo-Dravidian. In addition, stative-active structure has been

convincingly posited for earlier stages of Proto-Indo-European by a number of distinguished scholars (Karl Horst Schmidt; Winfred P. Lehmann; Thomas V. Gamkrelidze; Vjačeslav V. Ivanov, among others — for details, cf. Bomhard 2018, Chapter 20).

Dolgopolsky (2005) reconstructs the following Proto-Nostratic morphemes:

1. **nu* postposition, adverb, and preverb 'from'; postposition 'of'
2. **mA* postposition denoting a direct object
3. **{y}iyo* 'which', 'that which, related to'; it underlies (a) suffixes of relative adjectives and (b) suffix of the genitive base. According to Dolgopolsky, the etymon in question also functions as a separate word.
4. ?? **h{a}ya* directive-designative particle 'for'
5. **t{ä}* 'away (from), from'; ablative (separative) particle
6. **bayV* 'place'; 'to be (somewhere)' (= Spanish *estar*)
7. **d[oy]a* 'place (within, below), inside' (→ locative particle)
8. **mENV* (= **mEńV* ?) 'from'
9. **yu[⊥]t[i]* 'with, beside' (⊥ = unspecified consonant)
10. **ʔVrV* (> **rV*) theme-focusing (topicalizing) particle
11. **ʔiñ{A}* 'place' (→ 'in' in daughter languages)
12. **šawV* '(in the) middle'

The origin of the nominative singular markers in the daughter languages:

1. Proto-Indo-European **-s* < Proto-Nostratic **sE* demonstrative stem 'he/she';
2. Proto-Semitic **-u* < Proto-Nostratic **{h}u* = demonstrative particle 'iste';
3. Proto-East Cushitic **-i* and Proto-Kartvelian **-i* < Proto-Nostratic **{h}i* demonstrative particle 'iste' (or 'hic'). Dolgopolsky notes that all of these demonstrative stems still function as pronouns or definite articles.

The origin of the genitive case markers:

1. **nu* (see above)
2. **{y}iyo* (see above)
3. The pronominal particle **ha* 'ille' or **he* 'that' + pronominal **sE* 'he/she' (see above)

The origin of the plural forms:

1. **yE* (= **y{i}* ?) 'these, they' (animate plural deictic element)
2. **{ʔ}VśV* 'they'
3. **ʔa{h}a* 'thing(s)' (collective particle of animate) (= French *de ça*)
4. **n|ṅ{ä}* pronoun of collectivity and plurality
5. **l|ɭarwV* 'together, many'
6. **rV yE* (= **rV y{i}* ?) a compound pronoun of plurality
7. **tV* marker of plurality ('together')

8. **ʔ{o}mV* ‘kin, clan, everybody’

The origin of the verbal affixes:

1. **mi* ‘I’
2. **ṭ{ü}* (> **ṭi*) and its assibilated variant **ś{ü}* (> **śi*) ‘thou’
3. **HoyV* (= **hoyV* ?) ‘by me, my’
4. **n|ṅ{ä}* pronoun of collectivity and plurality (see above)
5. **n|ṅaʕi* ‘to go’ (→ ‘to go to do something’)
6. **ç|ci*, **ć\ći*, or **ĉ\ĉi* marker of verbal frequentativity/iterativity
7. **{s̄}Ew[0]V* ‘to want, to beg’ (→ desiderative)
8. **H{e}ṭV* ‘to make’ (> causitivizing morpheme)
9. **SuwYV* ‘to push, to cause’ (→ ‘to ask for’, → causative)
10. **t{a}wV* ‘head’ (→ ‘oneself’)
11. **woy[ʔ]E* ~ **wo[ʔ]yE* ‘power, ability’
12. **me[y]n̄U* ‘oneself, one’s own; body’

The origin of the nominal derivational affixes:

1. **mA* marker of nominalized syntactic constructions (= subordinate sentences), nominalizer (originally a pronoun) that formed analytic equivalents of *nomina actionis*, *nomina agentis*, and other derived nouns
2. **ṭi* syntactic particle; it is combined with verbs to build *nomina actionis*
3. **ṭV* marker of passive participial constructions
4. **n̄V* marker (pronoun) that formed analytic equivalents of passive participles (→ derived passive verbs)
5. **ʔVnṭV* ‘he’; relative ‘he who, that which’ (in daughter languages → a suffix of participles and derived *nomina*)
6. **ç|ćа* ~ **c|ća* (= **Hiç|ć|ća* ?) marker of relative constuctions (in daughter languages → suffix of adjectives)
7. **l̨e[ʔV]* (or **le[ʔV]V* ?) ‘being, having’ → analyticial (> synthetical) adjectivizer (→ formant of adjectives)
8. **y{a}* particle of hypocoristic (?) address (vocative)

The origin of the gender markers (feminine):

1. **{ʔ}atV* ‘female, woman’
2. **ʔ{ä}yV* (or **h{ä}yV* ?) ‘mother’ (originally a nursery word)
3. **ʔemA* ‘mother’
4. **ʔaʔV* ‘female’

The origin of the gender markers (masculine):

1. **ʔa* marker of the male sex [from ‘(young) man’ ?]

The origin of the gender markers (neuter):

1. **ṭä* demonstrative pronoun of non-active (inanimate) objects
2. **mA* postposition denoting a direct object. This is the source of the Proto-Indo-European neuter marker **-m* in thematic nouns and adjectives (cf., for example, Latin [nom. sg. masc.] *novus* 'new', [nom. sg. ntr.] *novum*), which goes back to the accusative marker **-m*.

Concerning the origin of root extensions, Dolgopolsky (2005) notes:

> But we cannot say the same about those elements of roots that are called "Wurzelerweiterungen", "Wurzeldeterminative", "root extensions", "élargissements", that is of those parts of roots of daughter languages (mostly root-final consonants) that are added or alternate without clear-cut and regular change of meaning. Some of them are probably explainable by lexical interaction of roots (Reimbildungen, influence of synonymic roots, etc.), but we cannot rule out the possibility that some of them reflect ancient (synthetic?) derivation. In order to elucidate this matter we need a systematic comparative investigation of all these "root extensions" [the extant literature (Persson 1901 for Indo-European, Hurwitz 1913 and Ehret 1989 for Semitic) has not produced satisfactory results, probably because each scholar worked with one daughter-family only without broader comparison]. Up to now the question of these determinatives remains open.

Unfortunately, Dolgopolsky gives far too much weight to later stage branches such as Uralic and Altaic, and his reconstructions, consequently, are, for the most part, more applicable to Eurasiatic than to Nostratic. The same is true for Illič-Svityč.

Appendix 1:
From Proto-Nostratic to Proto-Afroasiatic: Preliminary Thoughts

Though significant progress has been made in reconstructing the Proto-Afroasiatic phonological system and vocabulary, Proto-Afroasiatic morphology has not yet been reconstructed. Nevertheless, it is possible to trace, in broad outline, some of the developments that may have occurred, though much still remains uncertain.

Though Afrasian plays a critical role in the reconstruction of Proto-Nostratic morphology, there were many developments that occurred within Proto-Afrasian proper after it became separated from the rest of the Nostratic speech community. In this section, an attempt will be made to provide explanations for how some of the unique characteristics of Proto-Afrasian morphology may have come into being.

A. GENDER AND CASE: Proto-Nostratic nouns did not distinguish gender, and Pre-Proto-Afrasian nouns must also have lacked this category. However, based upon the evidence of the Afrasian daughter languages, gender must be reconstructed as an inherent part of noun morphology in Proto-Afrasian proper (cf. Frajzingier 2012:522—523).

Like Proto-Nostratic, Proto-Afrasian was most probably an active language. Two declensional types were inherited by Proto-Afrasian from Proto-Nostratic, each of which was distinguished by a special set of markers (see above, §7):

1. *-*u* was used to mark the subject in active constructions;
2. *-*a* was used to mark:

(a) The direct object of transitive verbs;
(b) The subject in stative constructions;
(c) The so-called "*status indeterminatus*".

Note: As in Proto-Nostratic, the marker *-*i* indicated possession in Proto-Afrasian. It was preserved as such in Proto-Semitic (cf. Gragg—Hoberman 2012:170; Rubin 2010:36; Moscati 1964:94, §12.64; Weninger 2011a:165) and partially in Cushitic (cf. Appleyard 2011: 44—48) and Omotic (cf. Zaborski 1990:619—620).

Importantly, Sasse (1984:117) reconstructs the following two declensional paradigms for nouns with short final vowels for Proto-East Cushitic:

	Masculine	Feminine
Absolute Case	*-*a*	*-*a*
Subject Case	*-*u/i*	*-*a*

Note: The absolute case is not to be confused with the "absolutive" case of ergative languages. It is a translation of Italian *forma assoluta* first used by Moreno in 1935 (cf. Mous 2012:369).

Sasse notes:

> Regardless of whether the neutralization of the case forms in the feminine nouns was inherited from the proto-language (that is, case forms for feminines never developed) or represents a historical stage during the reduction of the case-marking system which was once more elaborate, it is obvious that the lack of subject-object distinction with feminine nouns can be explained in functional terms. It is well known that in addition to the semantic category of neutral sex which is of minor importance the Cushitic gender categories primarily denote the notions of social significance (masculine) vs. social insignificance (feminine)… Since the primary function of subject and object cases is the distinction of agent and patient nouns, it is clear that case marking is more important for those noun classes that are designated to denote items which normally occur on both agents and patients (i.e. animates, big and strong beings, etc.) than for those noun classes which do not (inanimates, insignificant things, etc.). There is an interesting parallel in Indo-European, where neuter nouns generally do not distinguish subject and object. The personal pronouns and the demonstratives are naturally excluded from this neutralization, because they are more likely to refer to animates.
>
> Thus, the feminine forms reconstructed for Proto-East Cushitic by Sasse are to be derived from the *-*a* found in the masculine absolute. This must have been the oldest patterning, and, inasmuch as there are traces of this patterning in Berber and Semitic, it must ultimately go back to Proto-Afrasian. Once the category of gender was firmly established in Afrasian, the individual daughter languages exploited other means to indicate the feminine, such as, for example, the formant *-*t*-. For more information on how the category of gender is treated in the various branches, cf. especially D. Cohen (ed.) 1988 and Fajzyngier—Shay (eds.) 2012.

B. PRONOUNS: Proto-Afrasian had independent personal pronouns distinct from subject and object pronouns. The following independent personal pronouns may be reconstructed for Pre-Proto-Afrasian:

	Singular	Plural
1	*ʔ*V*-	**n*V*+Plural
2	**t*V*-	**t*V*+Plural
3	**s*V*-	**s*V*+Plural

Notes:

1. The first and second person forms were exactly as given above for the prefix conjugation personal prefixes, except that the third person prefix was based upon the stem **yV-* (cf. Satzinger 2003:394). This is an important piece of information, for it allows us to ascertain what the most archaic forms of the personal pronouns may have been and to speculate about their later development.
2. In Omotic, the first person is built upon the stem **ta-* and the second upon the stem **ne-* (cf. Welaitta 1st sg. subject *ta-ni*, 2nd sg. subject *ne-ni*). Curiously, similar forms show up in Elamite in the possessive pronouns of the second series: 1st sg. *-ta*, 2nd sg. *-ni*.

It should be noted that the first person singular and plural were originally two distinct stems. The first innovation was the combining of the two first person stems into a new compound form (cf. Militarëv 2011:77):

	Singular	Plural
1	**ʔV+nV-*	**ʔV+nV+*Plural
2	**tV-*	**tV+*Plural
3	**sV-*	**sV+*Plural

Then, **ʔV-* was extended to the second and third person forms in imitation of the first person forms:

	Singular	Plural
1	**ʔV+nV-*	**ʔV+nV+*Plural
2	**ʔV+tV-*	**ʔV+tV+*Plural
3	**ʔV+sV-*	**ʔV+sV+*Plural

Next, **-n-* was angalogically inserted into the second person forms on the basis of the first person forms:

	Singular	Plural
1	**ʔV+nV-*	**ʔV+nV+*Plural
2	**ʔV+n+tV-*	**ʔV+n+tV+*Plural
3	**ʔV+sV-*	**ʔV+sV+*Plural

Finally, separate feminine third person forms were created, and **-kV* was appended to the 1st person singular pronoun (cf. Akkadian *anāku* ‘I’; Egyptian *i̯n-k* ‘I’ // Coptic *anok* [ⲁⲛⲟⲕ] ‘I’; Moroccan Tamazight *nəkk* ‘I’).

No doubt, the changes described above occurred over a long period of time and may not have been fully completed by the time that the individual Afrasian daughter languages began to appear. Each daughter language, in turn, modified

the inherited system in various ways (for Semitic developments, cf. Del Olmo Lete 1999; for Cushitic, cf. Appleyard 1986). Here are attested forms in select Afrasian daughter languages (only the singular and plural forms are given) (cf. Frajzyngier—Shay [eds.] 2012; Diakonoff 1988:72—73; Gardiner 1957:53; Lipiński 1997:298—299; Moscati 1964:102; Rubin 2004:457—459; R. Stempel 1999:82):

	Semitic: Arabic	Semitic: Akkadian	Egyptian	Berber: Tuareg	Cushitic: Rendille
Singular					
1	*ʔanā*	*anāku*	*i̯n-k*	*n-ək*	*an(i)*
2 (m.)	*ʔanta*	*atta*	*nt-k*	*kay*	*at(i)*
(f.)	*ʔanti*	*atti*	*nt-t̲*	*kəm*	*at(i)*
3 (m.)	*huwa*	*šū*	*nt-f*	*nt-a*	*us(u)*
(f.)	*hiya*	*šī*	*nt-s*	*nt-a*	*iče*
Plural					
1 (m.)	*naḥnu*	*nīnu*	*i̯n-n*	*n-əkkă-ni*	*inno*
(f.)	*naḥnu*	*nīnu*	*i̯n-n*	*n-əkkă-nəti*	*inno*
2 (m.)	*ʔantum(ū)*	*attunu*	*nt-t̲n*	*kăw-ni*	*atin*
(f.)	*ʔantunna*	*attina*	*nt-t̲n*	*kămă-ti*	*atin*
3 (m.)	*hum(ū)*	*šunu*	*nt-sn*	*əntă-ni*	*ičo*
(f.)	*hunna*	*šina*	*nt-sn*	*əntă-nəti*	*ičo*

C. CONJUGATION: Proto-Afrisian had two conjugations: (1) a prefix conjuga-tion (active) and (2) a suffix conjugation (stative). The prefix conjugation became fixed early on in Proto-Afrasian, while the suffix conjugation was still very much a work in progress. Thus, the various daughter languages inherited a common prefix conjugation from Proto-Afrasian (except for Egyptian, which has no trace of the prefix conjugation [cf. Satzinger 2003:393]), while the suffix conjugations differed from branch to branch. The Proto-Afrasian personal prefixes were as follows (cf. Diakonoff 1988: 80; D. Cohen 1968:1309; Lipiński 1997:370—371; Satzinger 2003:394):

	Singular	Plural
1	**ʔV-*	**nV-*
2	**tV-*	**tV-*
3 (m.)	**yV-*	**yV-*
(f.)	**t-*	

Note: Masculine and feminine are not distinguished in the 3rd plural.

It is immediately obvious that these prefixes are based upon earlier Proto-Nostratic pronominal elements. Banti (2004:40) reconstructs a nearly identical set of forms for the Proto-Cushitic *suffix* conjugation (SC1):

	Singular	Plural
1	*Stem-*ʔV*	*Stem-*anV* (?)
2	*Stem-*tV*	*Stem-*tin*
3 (m.)	*Stem-*i*	*Stem-*in*
(f.)	*Stem-*tV*	

Notes:
1. The 2nd and 3rd plural forms contain the plural marker *-*n* (see Chapter 16, §16.26).
2. Masculine and feminine are not distinguished in the 3rd plural.

Compare now the personal prefixes reconstructed for Proto-Semitic by Lipiński (1997:370) (singular and plural only):

	Singular	Plural
1	*ʔa-	*ni-
2 (m.)	*ta-	*ti- ... -ū
2 (f.)	*ta- ... -t	*ti- ... -ā
3 (m.)	*ya-	*yi- ... -ū
3 (f.)	*ta-	*yi- ... -ā

Beja / Beḍawye has the following personal prefixes (cf. Appleyard 2007a: 467):

	Singular	Plural
1	ʔa-, -Ø-	ni-, -n-
2 (m.)	ti-, Ø-, -t-+-`a	ti-, -t-+-`na
2 (f.)	ti-, Ø-, -t-+-`i	
3 (m.)	ʔi-, Ø-, -y-	ʔi-, -y-+-`n(a)
3 (f.)	ti-, Ø-, -t-	

Note: Masculine and feminine are not distinguished in the 2nd and 3rd plural.

D. STATE: Proto-Semitic nouns had two distinct forms, depending upon their syntactic function (cf. Frajzingier 2012:533—534; Rubin 2010:38—40): (1) construct state (bound); and (2) free state (unbound) (additional states developed in the daughter languages). The construct state was used when a noun governed a following element. It had no special marker and was the unmarked form. The free state was used elsewhere and was the marked form. It was indicated by the markers *-*m(a)*/*-*n(a)*, which were appended after the case endings (cf. Rubin 2010:38—40). Ultimately, these markers had the same origin as the relational markers *-*ma* and *-*na*, which were originally used to

mark the direct object of transitive verbs as well as the subject in stative constructions (see above, §7; see also Michalove 2002a:94, note 2; Blažek 2014:28; Del Olmo Lete 2008). In Proto-Semitic, they were reinterpreted as markers of the free state.

Appendix 2:
Nostratic Sound Correspondences

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-AA	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
b-	b^h-	b-	b-	p-	p-	b-	p-
-b-	-b^h-	-b-	-b-	-w-	-pp-/-v-	-b-	-v-
p^h-	p^h-	p-	p-, f-	p-	p-	p^h-	p-
-p^h-	-p^h-	-p-	-p-, -f-	-p-	-pp-/-v-	-p^h-	-p(p)-
p'-	(p'-)	p'-	p'-			p-	
-p'-	(-p'-)	-p'-	-p'-			-p-	

d-	d^h-	d-	d-	t-	t-	d-	t-
-d-	-d^h-	-d-	-d-	-t-	-ṭ(ṭ)-	-d-	-ð-
t^h-	t^h-	t-	t-	t-	t-	t^h-	t-
-t^h-	-t^h-	-t-	-t-	-t(t)-	-tt-	-t^h-	-t(t)-
t'-	t'-	t'-	t'-	t-	t-	t-	t-
-t'-	-t'-	-t'-	-t'-	-t-	-t(t)-	-t-	-t-

d^y-	d^h-	ǯg-	d^y-	t^y-	c-	ǯ-	c-
-d^y-	-d^h-	-ǯg-	-d^y-	-t^y-	-c(c)-/-y-	-ǯ-/-d-	-c-
t^{yh}-	t^h-	čk-	t^y-	t^y-	c-	$č^h$-	c-
-t^{yh}-	-t^h-	-čk-	-t^y-	-t^y-	-c(c)-/-y-	-$č^h$-	-c(c)-
t'^{y}-	t'-	č'k'-	t'^{y}-	t^y-	c-	č-	c-
-t'^{y}-	-t'-	-č'k'-	-t'^{y}-	-t^yt^y-	-c(c)-/-y-	-č-	-c-
s^y-	s-	šk-	s^y-	s^y-	c-	s-	
-s^y-	-s-	-šk-	-s^y-	-s^y-	-c(c)-/-y-	-s-	

ʒ-	d^h-	ʒ-	ʒ-	č-	c-	ǯ-	c-
-ʒ-	-d^h-	-ʒ-	-ʒ-	-č-	-c(c)-	-ǯ-/-d-	-c-
c^h-	t^h-	c-	c-	č-	c-	$č^h$-	c-
-c^h-	-t^h-	-c-	-c-	-č-	-c(c)-	-$č^h$-	-c(c)-
c'-	t'-	c'-	c'-	č-	c-	č-	c-
-c'-	-t'-	-c'-	-c'-	-č-	-c(c)-	-č-	-c-
s-	s-	s-	s-	s-	c-	s-	
-s-	-s-	-s-	-s-	-s-	-c(c)-	-s-	
z-	s-	z-	z-	s-		z-	
-z-	-s-	-z-	-z-	-s-			

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-AA	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
ǯ-	d^h-	ǯ-	ʒ-	č-	c-	ǯ-	c-
-ǯ-	-d^h-	-ǯ-	-ʒ-	-č-	-c(c)-	-ǯ-/-d-	-c-
$č^h$-	t^h-	č-	c-	č-	c-	$č^h$-	c-
-$č^h$-	-t^h-	-č-	-c-	-č-	-c(c)-	-$č^h$-	-c(c)-
č'-	t'-	č'-	c'-	č-	c-	č-	c-
-č'-	-t'-	-č'-	-c'-	-č-	-c(c)-	-č-	-c-
š-	s-	š-	s-	s-	c-	s-	
-š-	-s-	-š-	-s-	-s-	-c(c)-	-s-	

g-	g^h-	g-	g-	k-	k-	g-	k- q-
-g-	-g^h-	-g-	-g-	-x-	-k-	-g-	-ɣ-
k^h-	k^h-	k-	k-	k-	k-	k^h-	k- q-
-k^h-	-k^h-	-k-	-k-	-k(k)-	-k(k)-	-k^h-	-k(k)- -q(q)-
k'-	k'-	k'-	k'-	k-	k-	k-	k- q-
-k'-	-k'-	-k'-	-k'-	-k-	-k(k)-	-k-	-k- -q-

g^w-	g^{wh}-	gw/u-	g^w-	k-	k-	g-	k- q-
-g^w-	-g^{wh}-	-gw/u-	-g^w-	-x-	-k-	-g-	-ɣ-
k^{wh}-	k^{wh}-	kw/u-	k^w-	k-	k-	k^h-	k- q-
-k^{wh}-	-k^{wh}-	-kw/u-	-k^w-	-k(k)-	-k(k)-	-k^h-	-k(k)- -q(q)-
k'^{w}-	k'^{w}-	k'w/u-	k'^{w}-	k-	k-	k-	k- q-
-k'^{w}-	-k'^{w}-	-k'w/u-	-k'^{w}-	-k-	-k(k)-	-k-	-k- -q-

ɢ-	g^h-	ɢ-	ɢ- (?)	k-	k-	g-	k- q-
-ɢ-	-g^h-	-ɢ-	-ɢ- (?)	-x-	-k-	-g-	-ɣ-
q^h-	k^h-	q-	q- (?)	k-	k-	k^h-	k- q-
-q^h-	-k^h-	-q-	-q- (?)	-k(k)-	-k(k)-	-k^h-	-k(k)- -q(q)-
q'-	k'-	q'-	q'- (?)	k-	k-	k-	k- q-
-q'-	-k'-	-q'-	-q'- (?)	-k	-k(k)-	-k-	-k- -q-
ɢ^w-	g^{wh}-	ɢw/u-	g^w-	k-	k-	g-	k- q-
-ɢ^w-	-g^{wh}-	-ɢw/u-	-g^w-	-x-	-k-	-g-	-ɣ-
q'^{w}-	k'^{w}-	q'w/u-	q'^{w}- (?)	k-	k-	k-	k- q-
-q'^{w}-	-k'^{w}-	-q'w/u-	-q'^{w}-	-k-	-k(k)-	-k-	-k- -q-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-AA	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
t͡ɬʰ-	kʰ-	x-	t͡ɬ-	sʸ-	c-	š-	ɬ-
-t͡ɬʰ-	-kʰ-	-x-	-t͡ɬ-	-δ-	-k-		-ɬ-
t͡ɬ’-	k’-	k’-	t͡ɬ’-	δʸ-	t-		
-t͡ɬ’-	-k’-	-k’-	-t͡ɬ’-	-δʸ-	-ṯ(ṭ)-		

ʕ-	ʕ͡ɦ-	Ø-	ʕ-	Ø-	Ø-	Ø-	Ø-
-ʕ-	-ʕ͡ɦ-	-Ø-	-ʕ-	-Ø-	-Ø-	-Ø-	-Ø-
ħ-	ħ͡h-	x-	ħ-	Ø-	Ø-	Ø-	Ø-
-ħ-	-ħ͡h-	-x-	-ħ-	-Ø-	-Ø-	-Ø-	-Ø-
ʔ-	ʔ-	Ø-	ʔ-	Ø-	Ø-	Ø-	Ø-
-ʔ-	-ʔ-	-Ø-	-ʔ-	-Ø-	-Ø-	-Ø-	-Ø-
ʔʷ-	ʔʷ-	w-	ʔʷ-	w-	v-/Ø-		v-
-ʔʷ-	-ʔʷ-	-w-	-ʔʷ-	-w-	-v-		-v-
h-	h-	Ø-	h-	Ø-	Ø-	Ø-	Ø-
-h-	-h-	-Ø-	-h-	-Ø-	-Ø-	-Ø-	-Ø-
x-	ħ͡h-	x-	x-	Ø-	Ø-	Ø-	Ø-
-x-	-ħ͡h-	-x-	-x-	-x-	-Ø-	-Ø-	-Ø-
xʷ-	ħ͡hʷ-	xw/u-	xʷ-	w-	v-/Ø-		v-
-xʷ-	-ħ͡hʷ-	-xw/u-	-xʷ	-x-	-v-		-v-
γ-	ʕ͡ɦ-	γ-	γ-	Ø-	Ø-	Ø-	Ø-
-γ-	-ʕ͡ɦ-	-γ-	-γ-	-Ø-	-Ø-	-Ø-	-Ø-

y-	y-	y-/Ø-	y-	y-	y-/Ø-		y-
-y-	-y-		-y-	-y-	-y-	-y-	-y-
w-	w-	w-	w-	w-	v-/Ø-		v-
-w-	-w-	-w-	-w-	-w-	-v-		-v-

m-	m-	m-	m-	m-	m-	m-	m-
-m-	-m-	-m-	-m-	-m-	-m-	-m-	-m-
n-	n-	n-	n-	n-	n-	n-	n-
-n-	-n-	-n-	-n-	-n-	-n-/-n̲-	-n-	-n-
nʸ-	n-	n-	n-	nʸ-	ñ-	nʸ-	
-nʸ-	-n-	-n-	-n-	-nʸ-	-ṉ-	-nʸ-	
-ŋ-	-n-	-n-	-ŋ-	-ŋ-	-ṉ-	-ŋ-	-ŋ-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-AA	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
l-	l-	l-	l-	l-	l-	l-	
-l-	-l-	-l-	-l-	-l-	-l-	-l-	-l-
-lʸ-	-l-	-l-	-l-	-lʸ-	l̤-	-lʸ-	-l- -y-
r-	-r-	-r-	-r-	r-			
-r-	-r-	-r-	-r-	-r-	-r-/-r̲-	-r-	-ʀ-
-rʸ-	-r-	-r-	-r-	-rʸ-	-r̤-	-rʸ-	

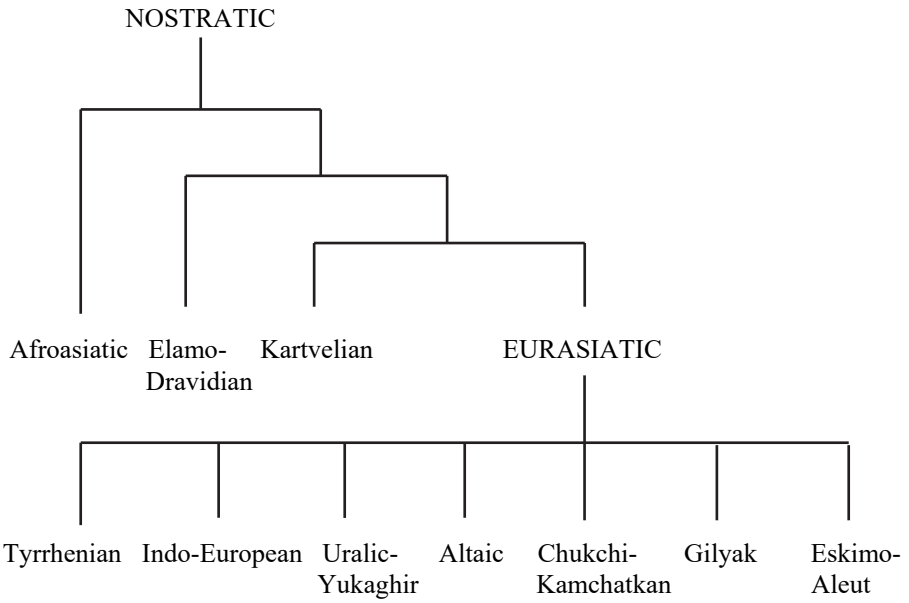
Note: In Eskimo, *-*lʸ*- > -*l*- after -*i*- but -*y*- after -*u*-.

i	i e	i	i	i	i	i	i
ə	e a ə	e i	i u	e	e	e	ə
u	u o	u	u	u	u	u	u
e	e	e	e	e	e	e	i
a	a o ə	a	a	a ä	a	a	a
o	o	o	o	o	o	o	u
iy	ĭy ey ī	iy i	iy	iy i	iy ī		iy
əy	ey ay	ey i	iy uy	ey	ey ē		əy
uy	ĭy ī ĭ	uy i	uy	uy	uy ū		uy
ey	ey ĭy ē	ey i	ey	ey e	ey ē		iy
ay	ay oy	ay i	ay	ay äy	ay ā		ay
oy	oy ĭy ĭ	oy i	oy	oy	oy ō		uy
iw	ū ŭw ŭ	iw u	iw	iw	iv ī		iv
əw	ew aw ŭw ŭ	ew u	iw uw	ew	ev ē		əv
uw	ū ō ŭw ow ŭ	uw u	uw	uw u	uv ū		uv
ew	ew ŭw ŭ	ew u	ew	ew	ev ē		iv
aw	ow ŭw ŭ	aw u	aw	aw äw	av ā		av
ow	ō ow ŭw ŭ	ow u	ow	ow o	ov ō		uv

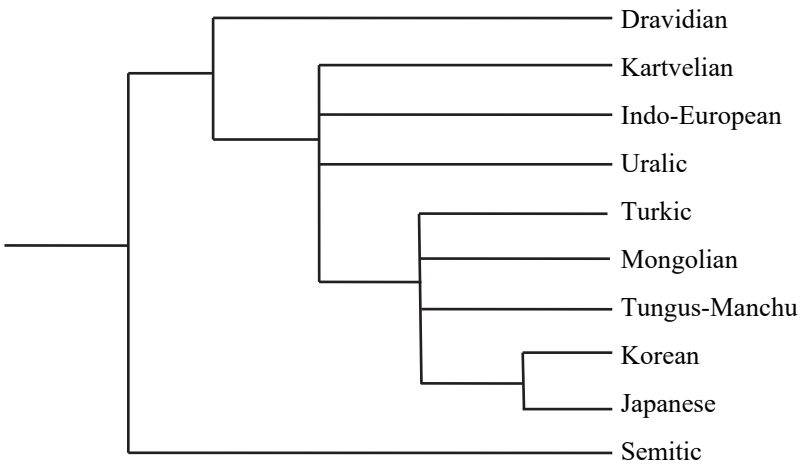
Note: The Proto-Altaic vowels are in accordance with Starostin—Dybo—Mudrak's reconstruction. The developments of the sequences **iy*, **əy*, **uy*, **ey*, **ay*, **oy*, **iw*, **əw*, **uw*, **ew*, **aw*, **ow* in Proto-Altaic are unclear.

Appendix 3:
The Nostratic Macrofamily

The following chart shows the subgrouping of the Nostratic daughter languages:



Somewhat similar views are expressed by Sergej Starostin (1999:66) in a computer-generated Nostratic family tree (see below), though he places Kartvelian closer to Indo-European than what is indicated in my chart, and he lists Semitic as a separate branch of Nostratic — clearly, this should be Afrasian (Afroasiatic):



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